MORE THAN 60 YEARS EXPERIENCE

CTE DIGITAL BROADCAST, with premises in Milan, Reggio Emilia and Bologna, controlled by its share holding partner MetaSystem was established in 2002. In the March 2008 the following Broadcast Transmitters companies have been integrated:

ELIT, established in Milano in 1946 and leading the start-up of Television in Italy, in tight cooperation with the Public corporation RAI (Radiotelevisione Italiana)

TEKO TELECOM, estabilished in 1972 and mainly committed to TV repeaters and TELECOM equipment

CTE BROADCAST, estabilished in 1973 soon becoming an important leader for Radio and TV Transmitters

The main focus of CTE Digital Broadcast is to emerge as a major participant in the worldwide radio and television transition from analogue to digital by deploying diverse expertise to provide state-of-the art solutions. Designing and producing our solutions, “Zero Defect” is the constant goal to set our excellent quality-price ratio.

By means of significant investments in research and development CTE Digital Broadcast is able to secure customer satisfaction throughout the Products entire life. Performance and reliability are kept as main focus of the whole production process, offering a real value-for-money option to the market. By the effective reorganization of its Product Area, CTE Digital Broadcast is able to grant total control of purchasing, logistics, production and testing, thus ensuring a product that meets all aspects of technical specification and fulfils the need of customers. The Corporate Headquarters is composed by two buildings of 2.800 square meters placed in Milan-Malpensa Airport area.

The premises in Milan, Reggio Emilia and Bologna include:

- More than 8.000 square of factory floor for production and supporting structures
- Ultra-modern instrumentation for testing, research and development
- Modern and automated machinery for packing and dispatch
- Anechoic chambers up to 18GHz
- Platforms for vibration test
- Equipment for thermal, humidity and fog controls
- Equipment for thermal shock testing -40°C+220°C

Products range

- New 5:1 DVB/T Dual Cast Agile Digital Transposer and transmitter
- FM Transmitters up to 10kW
- Antennas, filters, combiners, passive components
- Redundant System 1+1 and N+1

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5 in 1 DVB-T Transmitter & Dual Cast Agile Digital Transposer

TV EQUIPMENT

The VHF/UHF Dual cast Digital Transposers/ Digital Transmitters set new standards for ATV and DVB-T transposer and transmitter technology by combining top performance with an extensive number of features second to none. The equipment is characterized by the use of an internal advanced FPGA digital board able to satisfy all functionalities related to DVBT/H network. A single equipment can be software configured as a Transmitter, as a regenerative transposer, as a dual cast (analogue and digital) transposer or as a gap filler with digital echo canceller.

By using the web-interface management system all the functions can be set and monitored. The RF Signal, coming from the digital board, is boosted by an internal solid state design power amplifier for optimal performance in both digital and analogue broadcast applications. The equipment are able to operate in the frequency band VHF band III and UHF band IV & V.

Size and weight have been reduced to obtain a compact unit. The improved performance has been achieved by means of an advanced approach in the design, focusing on low power consumption and on excellent linearity over the entire operational band. High reliability is mainly guaranteed by using a limited number of transistors to achieve a given power target and by using over dimensioned cooling devices: broadcasters can thus reduce their long term system costs.

The Transmitter performs all the signal processing, from the MPEG-2 TS input to the RF output, completely meeting the ETSI EN 300 744 and EN 302 304 Standards.

The equipment is used for the radioelectric coverage of small and medium areas. It can be adopted both in MFN (Multi Frequency Network) or SFN (Single Frequency Network) mode, in DVB-H networks, in hierarchical or non hierarchical mode with 5/6/7/8 MHz bandwidth.

The Regenerative Transposer is a Dual Cast series CTE DB repeater fitted with the 'Regenerative' option. Thanks to this option the equipment performs a full 'regeneration' of the MPEG-2 TS signal, which is completely demodulated from the input RF signal, processed using the built-in error correction function, and finally re-transmitted adopting a COFDM spectrum in compliance with the DVB-T standards.
Moreover, the Regenerative Transposer, connected to an external multiplexer equipment, allows drop-insert operations on the re-transmitted TS signal.
Because of its features, the Regenerative Transposer can be used only with digital signals.
When configured as gap filler, the digital echo canceller function increases the potential output power by automatically suppressing feedbacks from the transmitting to the receiving antenna.

The echo canceller is furthermore capable of cleaning up the primary input affected by multi path echoes.

The primary benefit of using the echo canceller on a repeater site is, that the system will become stable even with a positive gain margin (echo level higher than input signal level) allowing more power to be transmitted from the site. The echo canceller will operate under steady state lab condition with a positive gain margin approaching 25 dB. The actual improvement of the gain margin for a given site will depend on several site related condition, but typically an improvement in gain margin in the order of 10-12 dB will be achieved.

Technical data

RF INPUT	
Connection	N
Input impedance	50 ohm
Return Loss	>16dB
Frequency range	30 MHz-1000MHz
Input Level	-60 dBm to -7 dBm
Input noise figure	<8dB@max gain (Typ.6.5 dB)
Selectivity	<65dB attenuation outside ±4.2 MHz relative to centre frequency, depending on selectivity-filter choice

RF OUTPUT	
Frequency range	VHF Band III and UHF IV&V
Impedance	50 ohm
Class	AB
Output Power	See below specification chart
Spurious emission	<-60 dBc with ext. output filter
Protections	Overpower, VSWR, Over voltage, Over current, Over Temperature
Probe	SMA Female connector RF for forward and reflected power
Modulation	DVB-T/H (transmitters, repeaters & regenerative) Analogue TV (only repeaters)
Load Mismatch	1.8:1 typical

For GAP_FILLER Effective output power will depend from antenna separation condition

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5 in 1 DVB-T Transmitter & Dual Cast Agile Digital Transposer

TV EQUIPMENT

DIGITAL SPECIFICATION	
Synchronism Type	Internal GPS (output with 1PPS and 10MHz input 1PPS and 10 MHz)
IF Filter	Digital with three level selectivity
Band	8, 7, 6, 5 MHz
Precorrection	Digital non-linear precorrection by software :curve Vo/Vi e S21, 256 point, gain correction up to +12dB, phase correction -6° +30° Digital linear precorrection by software: amplitude ±10 dB with 0.01 dB step; group delay ±1000ns step, 21 point 1/20BW resolution
Echo canceller	The size of the "cancelling window" can be configured to 7 µSec for an 8 MHz system bandwidth

SPECIFICATION	E25/100 DRU/DRV	E50/200 DRU/DRV	E10/50 DRU/DRV	E5/20 DRU/DRV
RF output power rms	40W	50W	12.5W	5W
RF output power peak sync	160W	200W	50W	20W
Output Connector	Nf	Nf	Nf	Nf
Dimension (WxHxD) mm	2U 485x88x500	2U 485x88x500	2U 485x88x500	2U 485x88x500
Weight	16	18	16	16
Power consumption @ DVB-T/H	350VA	400VA	200VA	100VA
Nr. of power supply boards	1	1	1	1
DC Power Supply	230 Vac± 10%	230 Vac± 10%	230 Vac± 10%	230 Vac± 10%
Number of fans	2	2	2	2

RTTE STANDARD COMPLIANCE	
Frequency Spectrum	EN 302 296 – EN302 297
EMC	EN 300-489-1 EN 301 489-14
Safety	EN 60950 – EN 60215

TEMPERATURE	
Operating range	-5° to 45°C (Meets ETS 300 019 requirements)
Storage range	-10° to 80° C
Maximum relative Humidity	90% non condensing
Max Operating Altitude	2500 m.a.s.l.

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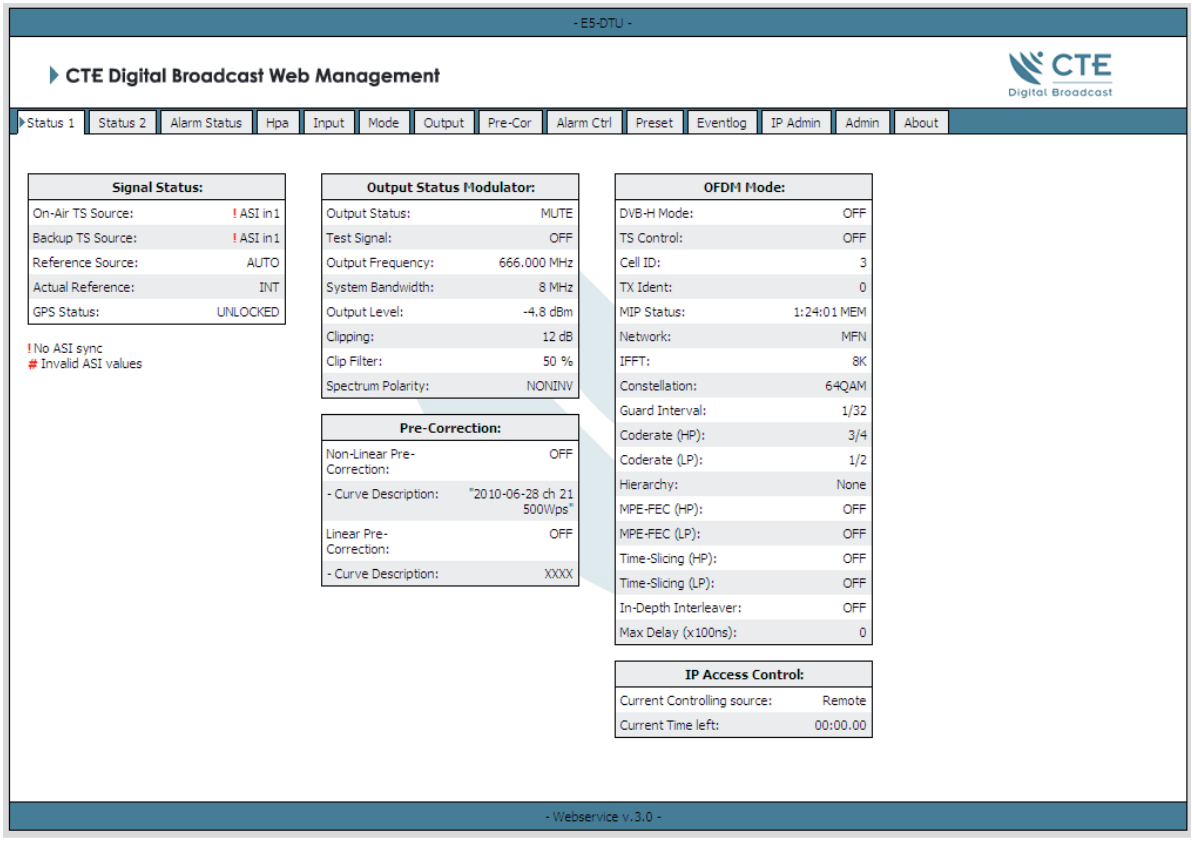
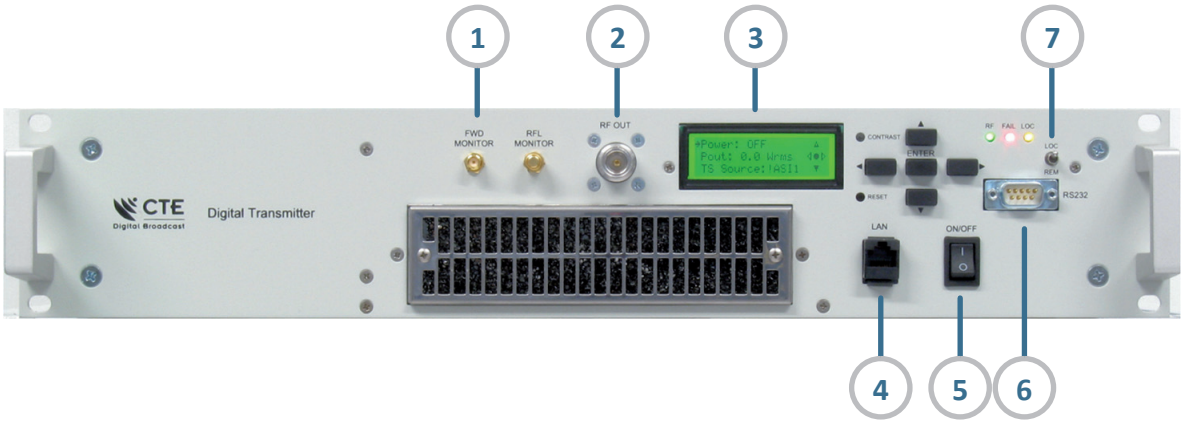
REMOTE CONTROL	
Ethernet WEB Server	LAN RJ45, TCP/IP protocol
SNMP Agent	Version 2
RS232/RS485	DB9 male connector
Parallel TS & TC	DB25 female connector



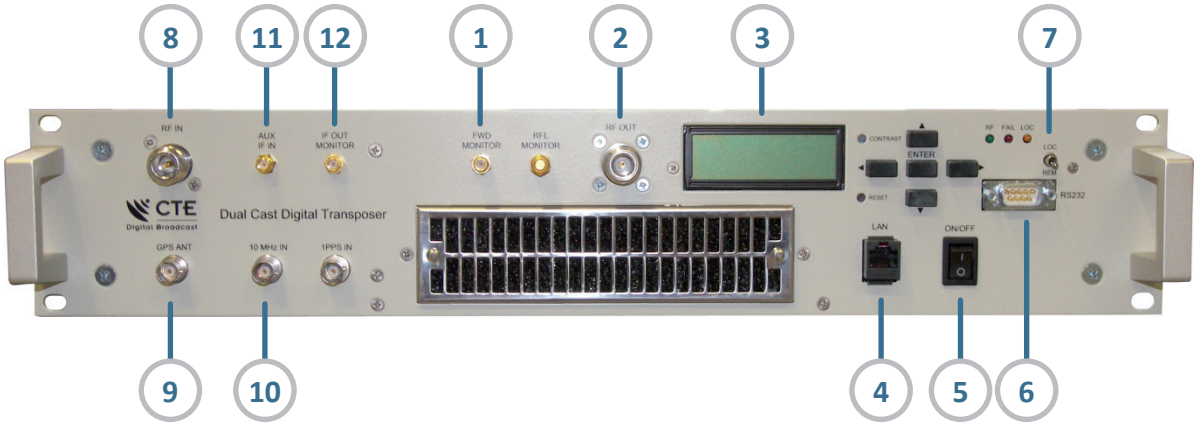
5 in 1 DVB-T Transmitter & Dual Cast Agile Digital Transposer

TV EQUIPMENT

Front panel Transmitter



Front panel Transposer

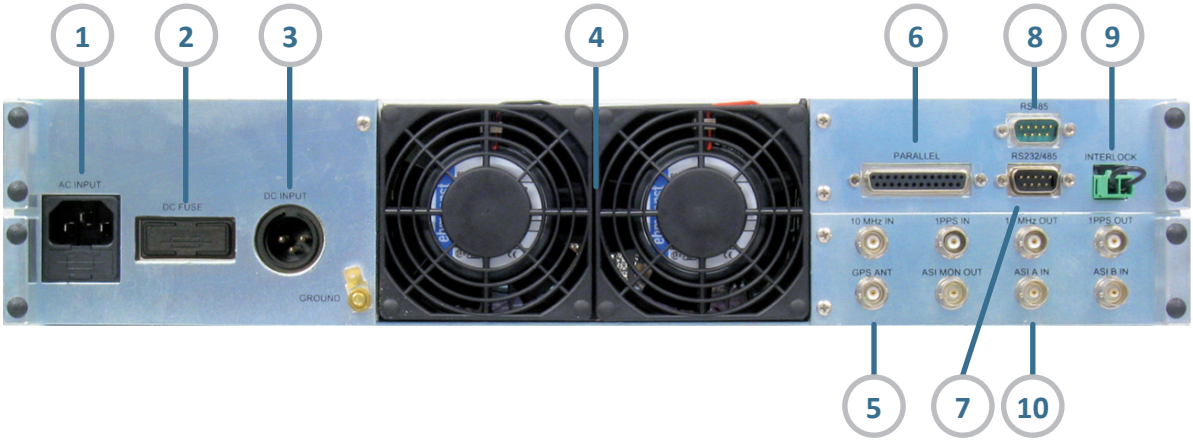


1. Monitor signals
2. RF Out N Connector
3. Control Panel
4. LAN- Input for LAN connection (Ethernet standard)
5. Power Line Switch – AC Power switch. Allows the whole equipment to be switched on/off
6. RS232
7. Loc/Rem – For control equipment modality
8. Input RF signal
9. GPS Antenna input
10. Input 10 MHz and 1ppm reference signals
11. AUX IF IN
12. IF Out monitor signal

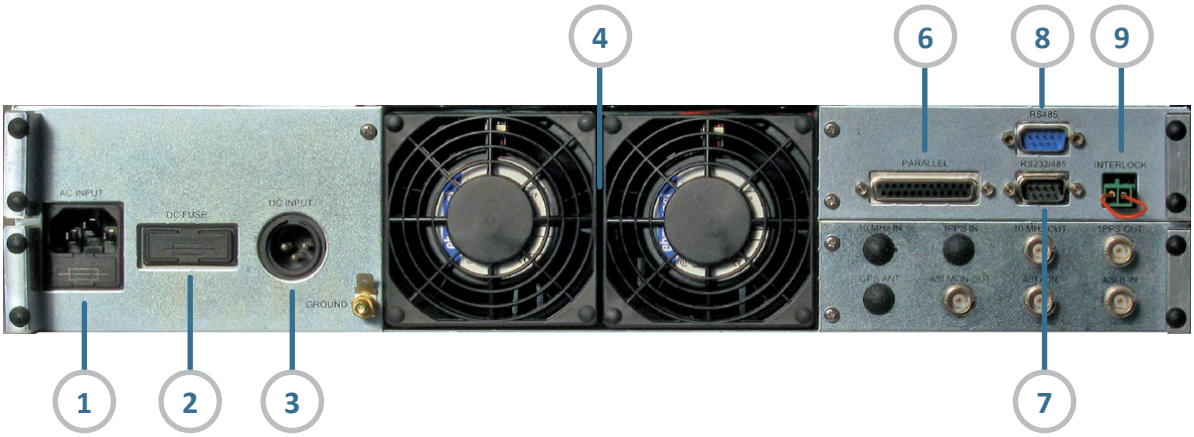
5 in 1 DVB-T Transmitter & Dual Cast Agile Digital Transposer

TV EQUIPMENT

Rear Panel Transmitter



Rear Panel Transposer



1. AC Input
2. DC Fuse
3. DC Input
4. Cooling fans
5. GPS Antenna input
6. I/O port for access and remote control
7. RS232/485 for access remote control
8. RS485
9. Interlock
10. ASI signals and reference signals

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TRANSMITTERS		
CODE	**MODEL**	**DESCRIPTION**
6003545034	E5-DTU	5W UHF DIGITAL AGILE TRANSMITTER
6003545035	E10-DTU	12.5W UHF DIGITAL AGILE TRANSMITTER
6003545036	E25-DTU	40W UHF DIGITAL AGILE TRANSMITTER
6003545044	E50-DTU	50W UHF DIGITAL AGILE TRANSMITTER
6003545039	E5-DTV	5W VHF DIGITAL AGILE TRANSMITTER
6003545040	E10-DTV	12.5W VHF DIGITAL AGILE TRANSMITTER
6003545045	E25-DTV	40W VHF DIGITAL AGILE TRANSMITTER
6003545041	E50-DTV	50W VHF DIGITAL AGILE TRANSMITTER

REPEATERS		
CODE	**MODEL**	**DESCRIPTION**
6002545538	E5/20-DRU	5W/20W UHF DIGITAL AGILE TRANSPOSER
6002545539	E10/50-DRU	12.5W/50W UHF DIGITAL AGILE TRANSPOSER
6002545548	E25/100-DRU	40W/160W UHF DIGITAL AGILE TRANSPOSER
6002545540	E50/200-DRU	50W/200W UHF DIGITAL AGILE TRANSPOSER
6002545543	E5/20-DRV	5W/20W VHF DIGITAL AGILE TRANSPOSER
6002545544	E10/50-DRV	12.5W/50W VHF DIGITAL AGILE TRANSPOSER
6002545549	E25/100-DRV	40W/160W VHF DIGITAL AGILE TRANSPOSER
6002545545	E50/200-DRV	50W/200W VHF DIGITAL AGILE TRANSPOSER

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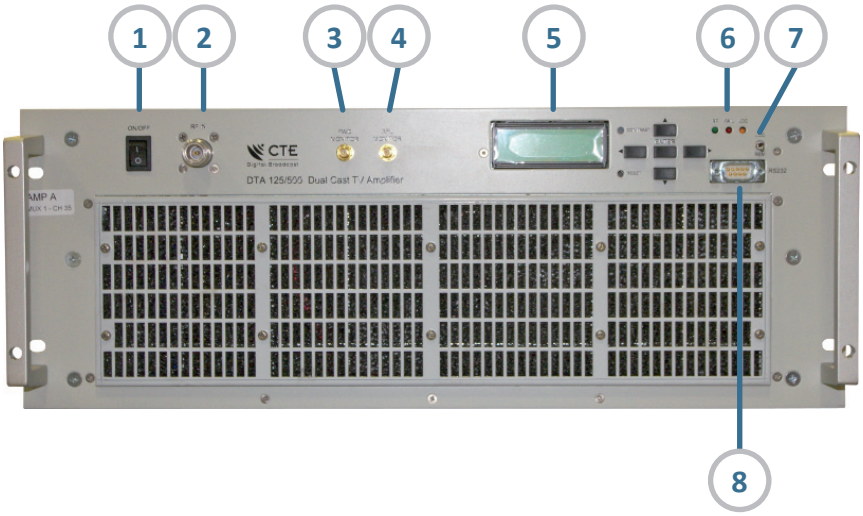
DTA 125-250/500 Power Amplifier

TV EQUIPMENT

The DTA 125/500 is an UHF or VHF TV amplifier designed for dual cast analogue TV / DVB-T operation. The maximum output power is 125Wrms in DVB-T and 500W ps in Analogue TV . The DTA 250/500 is the 250Wrms/500Wps version based on 50V technology. The maximium output power in digital operation is up to 320Wrms. The nominal gain is 21 ±0.5 dB (DTA 125/500) and 24 ±0.5 dB (DTA 250/500) for all channels and for the whole temperature range (-5° to +45° C) thanks to the internal compensation circuitry. The nominal driving input level is 1Wrms and 4W ps for both models. Both models are composed by 3 blocks of pallets, one LD-MOS driver amplifier and 2 combined LDMOS Final Amplifiers. The driver amplifier is connected to the inputs of the 2 LD-MOS Final Amplifiers through one, “2 Ways splitter”. The 2 final amplifier outputs are combined with one combiner. The output of the hybrid, through a Directional Coupler is connected to the RF output connector. The Power supply for the amplifiers is a AC/DC Converter single phase. A 5V service power supply is present for control unit. Two blowers cool the amplifiers heatsink while an additional blower cools the power supply. Blowers speed is contolled by temperature. Both Amplifier models are allocated into a 4 S.U and 500mm depth cabinet.

Front panel



1. Power Line Switch – AC Power switch. Allows the whole equipment to be switched on/off
2. RF IN
3. Out monitor direct signal
4. Out monitor reflected signal
5. Control Panel
6. Status Led
7. Loc/Rem – For control equipment modality
8. RS232

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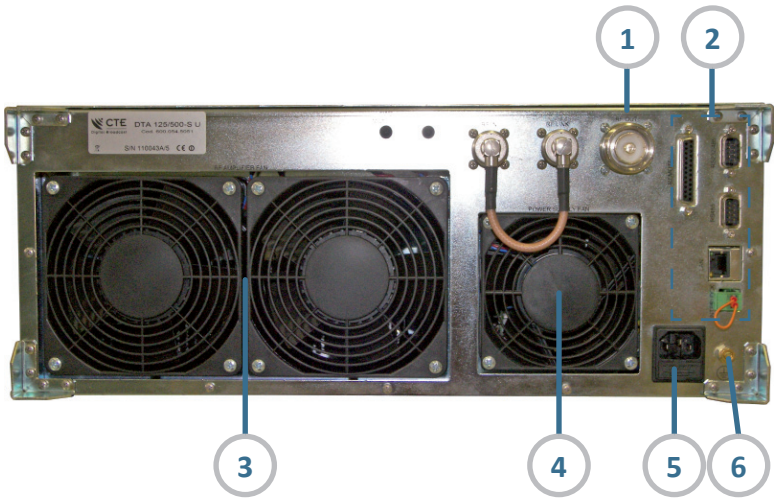
DTA 125-250/500 Power Amplifier
TV EQUIPMENT

Rear panel



1. RF Out
2. Data line
3. RF Amplifier FAN
4. Power supply FAN
5. AC input
6. Ground screw

SPECIFICATION	DTA 125-500	DTA 250-500
Band of operation	VHF 174÷230 MHz UHF 470÷860 MHz	UHF 470÷860 MHz
RF Power Output	500W ps /125 W rms DVB-T	600W ps /320W rms DVB-T
Input Connector	N	
Output Connector	7/16	
Impedance (OUT)	50Ω	
Typical Gain	VHF 21dB UHF 21dB	UHF 21dB
Input Typical Power	VHF about 1W rms /4W ps UHF about 1W rms/4W ps	UHF about 1W rms/4W ps
Temperature range of operation	[-5 ÷45]°C	
Max Relative humidity	90% non condensing	
Dimension	4 S.U.x 485x500mm	
Weight	About 26Kg	
Supply	230Vac 50 Hz single Phase	
Max power consumption	1700 VA (black level)	2300 VA
Cooling type	-	Forced air circulation
Remote Control	RS232/485, Parallel, Web Server, SNMP	

CODE	MODEL	DESCRIPTION
6000545051	DTA125-S	125W rms 500W ps UHF Amplifier
6000545052	DTA125-S	125W rms 500W ps VHF Amplifier
6000545053	DTA250-S	320W rms 600W ps UHF Amplifier

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ACU 1+1
TV EQUIPMENT

The ACU models are universal and flexible automatic change-over units designed for controlling FM radio and television repeaters and transmitters. ACU 1+1 R includes two RF internal switches in 3 + 4 ports configuration for redundant repeater systems. ACU 1+1 T includes a 4 ports RF internal switch for redundant transmitter systems. It can also control an external high power coaxial relay. Baseband audio and video full passive routing inputs are as well available. In case of breakdown of the main RF signal, the equipment operates the subsequent switch-over to the auxiliary source, thus ensuring continuity of service. The internal 4 ports coaxial relay allows switch-over of RF signals up to 750W rms power and frequency up to 1 GHz. By means of the dedicated dB-25 connector located in the rear panel of the unit, it can be matched with any type of external coaxial relay to control any high-power installations. The unit, which is 100% microprocessor-controlled, allows the software-operated configuration of all operating parameters, such as a low power threshold, waiting and switching time. The graphic display makes it possible to check the parameter setting and the operational status of the system. Automatic operating can be deactivated from the front panel in order to allow the manual control of switching. All base-band routing is made by means of fully passive bistable circuitry in order to grant the signal continuity even in case the changeover unit gets damaged. The unit features a dual independent mains power system and, as a standard, it is equipped with low voltage DC input for battery supplied systems.

THECNICAL DATA	ACU 1+1 T	ACU 1+1 R	ACU 1+1 U
Video A, Video B	-	-	BNC, 75 Ohm fully passive routing
Audio stereo	-	-	Left A (main), Left B (aux), Right A (main), Right B (aux)
Audio Connector	-	-	standard XLR fully passive routing
Output connector	N Type Female 50 Ohm	N Type Female 50 Ohm	N Type Female 50 Ohm
Parallel port	25 pin sub-D connector		
Max output power	750W rms (4 ports switch)		350W (3 ports switch)
Serial RS232/RS485	9 pin sub-D connector (selectable by user)		
Ethernet TCP/IP	RJ45		
Temperature operating range	-5° to 45° C		
Maximum relative Humidity	90% non condensing		
Dimension (WxHxD) mm	485 x 88 x 490		
Weight	max 10 kg		
Power consumption	50VA		
power supply	2 power supplies 230 VCA – 50 Hz (6 KV insulation)		
DC Power Supply	24V		

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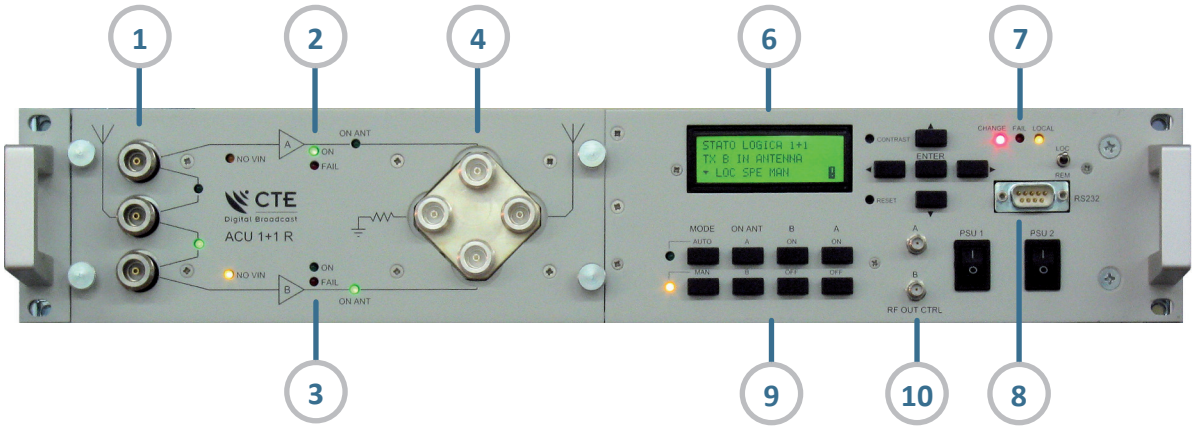
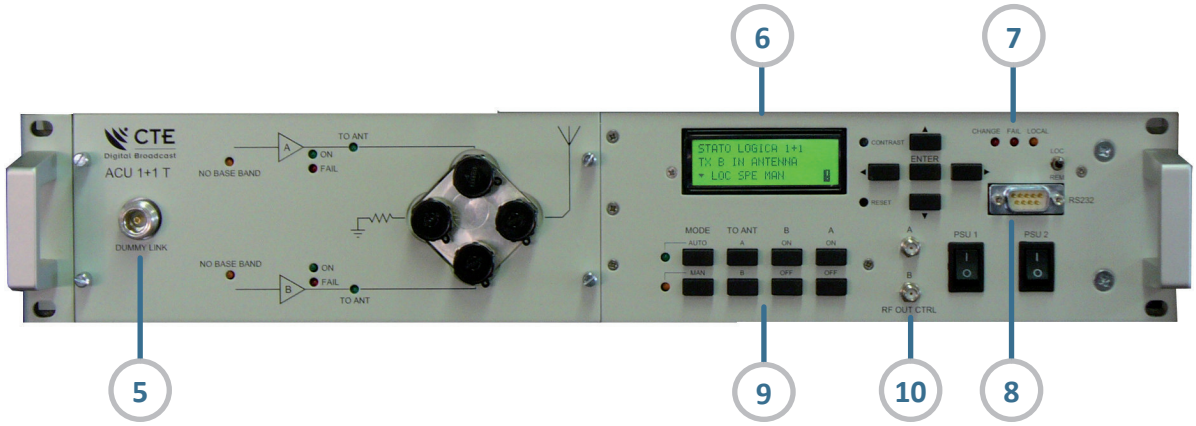
Front panel ACU R



Front panel ACU T



1. 3-ports input relay assembly
2. Way A status information
3. Way B status information
4. 4-ports output relay assembly
5. Dummy link N connector
6. Control panel
7. Status LEDs
8. RS232
9. Manual changeover control area
10. RF signals monitoring area (OPTIONAL)

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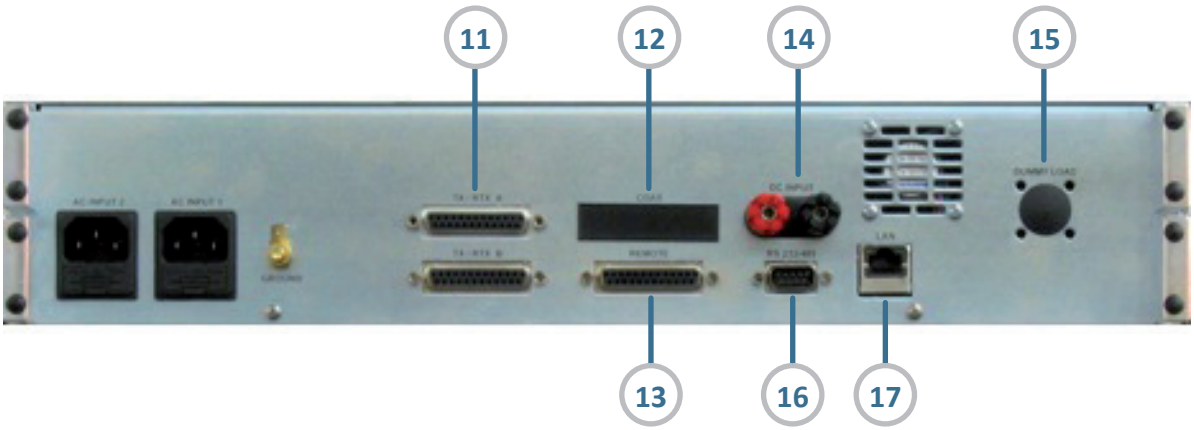
Rear Panel ACU



11. TX/RTX A e B (DB25 female connector)
12. COAX
13. REMOTE (DB25 female connector)
14. DC Input
15. DUMMY LOAD (N connector)
16. RS232/485 (DB9 male connector)
17. LAN (RJ45 connector)

CODE	MODEL	DESCRIPTION
6001050637	ACU 1+1 T	Automatic changeover FOR TV & FM with 4 ports switch 750W
6001050638	ACU 1+1 R	Automatic changeover FOR TV & FM with input 3 ports switch and output 4 port switch 750W
6001050640	ACU 1+1 U	Automatic changeover FOR FM & TV with A/V input and 3 ports switch 350W
6001050641	ACU 1+1 U EXT	Automatic changeover FOR FM & TV with A/V input (external switch)
6001050642	ACU 1+1 DD	Automatic changeover FOR FM & TV (external switch)

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CTE Digital Broadcast

TEKO TELECOM

Trasmettitori Ripetitori e Gap Filler dual mode TV e DVB-T/H VHF/UHF

Dual mode ATV and DVB-T/H VHF/UHF Transmitters, Translators and Gap-fillers

BLD TV Transmitters, Transposers and Gap-Fillers range of equipment, having 1 or 2.5W RF output power, has been designed to offer complete DVB-T, DVB-H and DAB B.III signals compatibility.

The equipment is made up of 8 plug-in modules housed in a 19" - 3U standard rack; each module can be replaced by a spare one without changing the overall technical features.

All RF circuits are wide band. Easily adjustable 2 and 3 cell filters determine the operating channel. Reception and transmission oscillators are synthesized and the L.O. frequencies can be programmed from the front panel.

Two A.G.C.'s are available on the equipment: one controls the receiver and the other one the RF output power.

The test instrument for some basic parameters and the signal LED's make the equipment operation control easier, even during operation.

The equipment remote signals and controls are available on multiple connectors located on its rear panel.

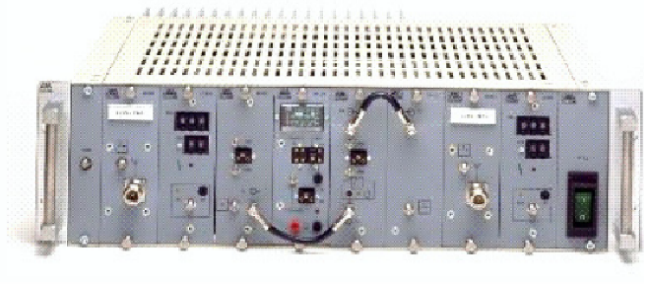
La serie di apparati trasmettitori, ripetitori e gap-filler BLD, con potenza di uscita RF 1 o 2,5W, nasce per la piena compatibilità ai segnali digitali DVB-T e DVB-H, nonché DAB BIII.

La serie dei ripetitori è completamente dual mode, ovvero può funzionare correttamente sia con segnale digitale DVB-T o DVB-H che con segnale analogico ATV senza necessità di alcun intervento da parte dell`operatore.

L'apparato è suddiviso in 8 moduli estraibili e contenuti in un rack da 3U 19” standard; ogni modulo è sostituibile con un altro uguale senza alcuna modifica delle caratteristiche tecniche globali. Tutti i circuiti RF sono a larga banda e filtri a 2 e a 3 celle facilmente sintonizzabili determinano il canale di funzionamento. Gli oscillatori di ricezione e trasmissione sono sintetizzati e le frequenze di O.L. sono programmabili dal pannello frontale.

Sull'apparato sono previsti due CAG, uno che controlla il ricevitore e l'altro la potenza RF d'uscita.

Lo strumento per la misura di alcune grandezze significative ed i LED di segnalazione facilitano il controllo del funzionamento dell'apparato anche in esercizio. I telesegnali e telecomandi per il controllo a distanza dell'apparato sono disponibili su connettori multipli posti sul pannello posteriore.



Dual Mode Transmitters – Translators - Gap Filler

ATV DVB-T DVB-H

La série BLD d'émetteurs, réémetteurs TV et Gap-Filler, avec puissance de sortie RF de 1 ou 2,5W, a été projeté pour offrir la complète compatibilité DVB-T / DVB-H et DAB B.III.

L'équipement est composé de 8 modules plugin, logés dans un rack 19 "-3U standard; chaque module peut être remplacé avec un autre de rechange sans aucun changement des caractéristiques techniques générales.

Tous les circuits de RF sont à large bande et des filtres à 2-et 3-celles facilement réglables déterminent le canal de fonctionnement.

Les oscillateurs de réception et de transmission sont synthétisés et les fréquences L.O. peuvent être programmées directement sur le panneau frontal de l'équipement. Deux CAG sont disponibles sur l'équipement.

L'un qui contrôle le récepteur et l'autre qui contrôle la puissance de sortie RF. L'instrument de mesure pour les paramètres de base et les LED de signalisation d'alarme, rendent le contrôle de l'équipement plus facile, même pendant son service. Les télésignaux et les télécommandes de l'équipement sont disponibles sur des connecteurs multiples placés sur son panneau arrière.

Caption of the BLD equipment codes					
BLD	1	2	3	4	
Where:					
	1 = input band: (FI = IF ; 3 = band III VHF; 4 = band UHF)				
		2 = output band: (3 = band III VHF; 4 = band UHF)			
			3 = U for 1Hz step synthetizer – G for Gap-Filler version		
				4 = output power: 1 = 1W ; 3 = 2.5W (digital power) - 1=2W; 3= 10W (analog power)	

Options:	RX/TX offset	Internal stability	external reference
U	1 Hz	± 0.1ppm/y	10 MHz
G	Input / output same frequency (only one OL)	± 1ppm/y	5 MHz

BLD ATV Technical characteristics	
Basic TV transmitter (common amplification) IF input version	
Intermediate frequency input band (standard B/G CCIR).	IF standard Pv 38,9 MHz / Pa 33,4 MHz(NICAM compatible)
Other CCIR standard on request M/N D/K I	
Input impedance	50 ohm
Input connector	SMA (f)
Input return loss	³20 dB
Output operating bands TX (on request 47¸88 MHz)	47÷68MHz (VHF B.I) 470÷860MHz (UHF) 174÷230MHz (VHF B.III)

BLD ATV Technical characteristics		
CH input version	VHF	UHF
RX operating bands	174÷230MHz (VHF B.III)	470÷860MHz (UHF)
Input impedance	50 Ohm	
Input connector	N (f)	
Input return loss	³20dB	
Noise figure	£6dB	
Intermediate frequency input band (standard B/G CCIR) Other CCIR standard on request M/N D/K I	IF standard Pv 38,9 MHz / Pa 33,4 MHz(NICAM compatible)	

BLD Intermodulation characteristics					
	VHF		UHF		
Intermodulation attenuation with double audio (Vc -5dB, Sc1 -13dB, Sc2 -20dB, Cc -17 dB referred to Vc at sync peak)	2W	10W	2W	5W	10W
without linearity precorrector	-54dBc	-53dBc	-54dBc	-56dBc	-50dBc
with internal linearity precorrector	-60dBc	-60dBc	-60dBc	-60dBc	-60dBc
Out of band intermodulation products (Vc = nom.; Sc = Vc -10dB reference to Vc -5.5 MHz and Vc +11MHz)	-60dBc	-60dBc	-60dBc	-60dBc	-54dBc

BLD ATV Output characteristics					
	VHF		UHF		
	2W	10W	2W	5W	10W
Output operating bands TX (on request 47÷88 MHz)	174÷230MHz (VHF B.III)		470÷860MHz (UHF)		
Output impedance	50 ohm				
Output connector	N (f)				
Output power	0.5 to 2W	2.5 to 10W	0.5 to 2W	2.5 to 10W	
A.G.C. efficiency: IF input signal from -20 to +5dBm (0dBm standard) with video and IF squelch	nom. ±0.5dB				
Amplitude frequency response input-output (from Vc -0.75 MHz to Sc +0.25 MHz)	<± 1dB				
Group delay (from Vc -0.75 MHz to Sc +0.25 MHz)	±30 nS				
S/N video unweighted (10KHz to 5 MHz)	≥58dB				
Audio carrier S/N ratio (dev. ±50 KHz at 400 Hz 40Hz÷15KHz frequency) unweighted	≥60dB				
Out of band spurious signals (except Vc -5.5 and +11MHz refered to Vc at sync peak)	≤-60dBc				
Signal to hum (peak value) ratio (f≤10KHc)	≥50dB				
Transmitted carrier harmonics (referred to Vc at synch.peak)	≤-70dBc				
Sync. pulse compression	≤3%				
Differential gain (CCIR signal)	≤2%				
Differential phase	≤2°				

DVB-T/H TRANSMITTER	**BLDFI3U1 BLDFI3U3**	**BLDFI4U1 BLDFI4U3**		
INPUT/OUTPUT CHARACTERISTICS				
Input intermediate center frequency	36MHz ± 2MHz			
TX operating band	VHF 170-230MHz	UHF 470-860MHz		
Input impedance	50Ohm			
Input connector	SMA			
Input return loss	≥ 20dB			
Input signal level	-6dBm ±3dB			
Output impedance	50Ohm			
Output connector	N(f)			
Output return loss	≥ 20dB			
Shoulder attenuation (with precorrection)	≥ 38dB			
M.E.R. (with precorrection)	≥ 35dB			
TRANSMITTER LOCAL OSCILLATOR CHARACTERISTICS				
TX frequency resolution	1Hz	1Hz		
Phase noise local oscillator	-85dBc/Hz at 100Hz; -85dBc/Hz at 1KHz (-90dBc/Hz typical); -95dBc/Hz at10KHz (-100dBc/Hz typical);			
Reference oscillator internal: frequency stability frequency adjustment external input reference	OCXO 10MHz ± 0.1ppm ± 10Hz 10 MHz			

ATV, DVB-T/H TRANSMITTER OUTPUT POWER, POWER SUPPLY AND DIMENSIONS	**BLD...1**	**BLD...3**
Output power	Up to 1W DVB, to 2W TV	Up to 2.5W DVB, to 10W TV
Power supply from MAINS	176 to 264Vca / 48 to 62Hz	
Power consumption from MAINS (PF 0.8)	≤ 60VA	≤ 145VA
Power consumption from MAINS in stand-by mode	≤ 25VA	
Power supply from BATTERY	± 36 to 63 Vdc	
Power consumption from BATTERY	≤ 43W	≤ 105W
Power consumption from BATTERY in stand-by mode	≤ 15W	
Operating environmental temperature	-5°C to +45°C (or –10°C to +50°C extended range, with small reversible performances degradation)	
Operating environmental RU	Up to 95%	
Dimensions	19" 3U rack	
Depth	400mm	
Weight	about Kg.14	about Kg.15

DVB-T/H TRANSLATOR "DUAL CAST"	**BLD33U1 BLD33U3**	**BLD33C1 BLD33C3**	**BLD44U1 BLD44U3**	**BLD44C1 BLD44C3**
INPUT/OUTPUT CHARACTERISTICS *(the translator can be equipped with 8 MHz or 7 MHz SAW FILTER)*				
RX operating band	VHF 170-230MHz		UHF 470-860MHz	
Input impedance	50Ohm			
Input connector	N (f)			
Input return loss	≥ 20dB			
Input level range	40 – 77dBµV			
Selectivity: QEF reception (BER 2E-4) obtained with –47dBm input signal level (BW = 8MHz)	-40dB (C/I with CW at -10.75MHz from the center) -20dB (C/I with CW at -5.448MHz from the center) -20dB (C/I with CW at +5.25MHz from the center)			
3-cell input filter selectivity (reference to the center frequency of the received channel) ± 8MHz ± 16MHz	>5dB >20dB			
Noise figure (input signal -47dBm)	≤6dB			
Input intermediate center frequency	36MHz (BW=8MHz), 36.3MHz (BW=7MHz)			
TX operating band	VHF 170-230MHz		UHF 470-860MHz	
Total group delay	≤5µS			
Output impedance	50Ohm			
Output connector	N(f)			
Output return loss	≥ 20dB			
Shoulder attenuation (with precorrection)	≥ 38dB			
Amplitude frequency response	≤±0.5dB			
TRANSPOSER LOCAL OSCILLATOR CHARACTERISTICS				
RX / TX frequency resolution	1 Hz	500 KHz	1 Hz	500 KHz
Phase noise local oscillator	-85dBc/Hz at 100Hz; -85dBc/Hz at 1KHz (-90dBc/Hz typical); -95dBc/Hz at 10KHz (-100dBc/Hz typical);			
Reference oscillator internal : frequency stability frequency adjustament external input reference	OCXO 10MHz ± 0.1ppm ± 10Hz 10 MHz			

DVB-T/H TRANSLATOR OUTPUT POWER, POWER SUPPLY AND DIMENSIONS	**BLD...1**	**BLD...3**
Output power	Up to 1W	Up to 2.5W
Power supply from MAINS	176 to 264Vca / 48 to 62Hz	
Power consumption from MAINS (PF 0.8)	≤ 60VA	≤ 145VA
Power consumption from MAINS in stand-by mode	≤ 25VA	
Power supply from BATTERY	± 36 to 63 Vdc	
Power consumption from BATTERY	≤ 43W	≤ 105W
Power consumption from BATTERY in stand-by mode	≤ 15W	
Operating environmental temperature	-5°C to +45°C (or –10°C to +50°C extended range, with small reversible performances degradation)	
Operating environmental RU	Up to 95%	
Dimensions	19" 3U rack	
Depth	400mm	
Weight	about Kg.15	about Kg.16

DVB-T/H DAB BIII Gap-Filler (*)	BLD33G1 BLD33G3	BLD44G1 BLD44G3
RX operating band	VHF 170-230MHz	UHF 470-860MHz
Input impedance	50ohm	
Input connector	N(f)	
Input return loss	>=20dB	
Input level range	40-77dBuV	
3-cell input filter selectivity (reference to the center frequency of the received channel) ± 8MHz ± 16MHz	>5dB >20dB	
Noise figure (input signal -47dBm)	<=6dB	
IF frequency	36.3MHz (BW=7MHz)	36MHz (BW=8MHz)
Total group delay	≤5µS	≤5µS
TX operating band	VHF 170-230MHz	UHF 470-860MHz
Output impedance	50ohm	
Output Connector	N(f)	
Output return loss	>=20dB	
Shoulder attenuation (with prec..)	>=38dB	
Amplitude frequency response	<=+/-0.5dB	
LOCAL OSCILLATOR CHARACTERISTICS		
RX / TX frequency resolution (at same frequency)	10kHz	
Phaise noise noise oscillator	-85dBc/Hz @1kHz	
Reference oscillator internal frequency stability frequency adjustament	TCXO 5MHz ± 1ppm ± 15Hz	

(*) E' necessario garantire un isolamento tra l'antenna ricevente e trasmittente di 10dB superiore al guadagno operativo del gap-filler

(*) The necessary isolation between the RX and TX antenna shall be 10dB higher the Gap-Filler operative gain.

DVB-T/H Gap-Filler OUTPUT POWER, POWER SUPPLY AND DIMENSIONS	BLD...1	BLD...3
Output power	Up to 1W	Up to 2.5W
Power supply from MAINS	176 to 264Vca / 48 to 62Hz	
Power consumption from MAINS (PF 0.8)	≤ 60VA	≤ 145VA
Power consumption from MAINS in stand-by mode	≤ 25VA	
Power supply from BATTERY	± 36 to 63 Vdc	
Power consumption from BATTERY	≤ 43W	≤ 105W
Power consumption from BATTERY in stand-by mode	≤ 15W	
Operating environmental temperature	-5°C to +45°C (or –10°C to +50°C extended range, with small reversible performances degradation)	
Operating environmental RU	Up to 95%	
Dimensions	19" 3U rack	
Depth	400mm	
Weight	about Kg.15	about Kg.16

Dual Mode Transmitters - Translators - Gap Filler

CTE Digital Broadcast

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TEKO TELECOM MetaSystem Group

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CTE Digital Broadcast

TEKO TELECOM

Ripetitore DVB-T DVB-H AGILE

DVB-T DVB-H AGILE Translator

Il ripetitore è un dispositivo che può trovare vaste applicazioni nella pianificazione e nella realizzazione di reti di copertura DVB-T/H. Il ripetitore Teko Telecom risponde in modo efficace alle rinnovate esigenze del gestore della rete. La sua caratteristica principale è l'agilità in frequenza: grazie alla filosofia dei circuiti di conversione down e up e all'assenza di filtri di ingresso e di uscita, il ripetitore può essere facilmente configurato su altri canali. Grazie ad un innovativo sistema di rilevazione del tipo di modulazione, il ripetitore della serie Agile è in grado di configurarsi automaticamente come ripetitore analogico o digitale, a seconda del tipo di segnale in transito. Questa funzionalità permette di gestire al meglio la fase di transizione dalla diffusione della TV analogica al digitale terrestre (swichover), nonchè la fase sperimentale. Lo stadio di ingresso opera su tutta la banda 50–860MHz con una dinamica estesa e una elevata linearità. Le prestazioni ottenute tramite l'implementazione di un filtro IF digitale (Domanda di brevetto BO2004A 000487) consente all'operatore di affrontare in modo efficiente e dinamico le più severe esigenze di radiocopertura. Il suo utilizzo riduce il tempo di transito e permette una precisa ed efficiente regolazione della selettività, mentre l'equalizzatore del ritardo di gruppo e di ampiezza consente la compensazione delle distorsioni introdotte da filtri di uscita di potenza. Con potenza di uscita fino a 0,1W (operante su tutta la banda 50 – 860MHz) e 1W (operante in banda VHF o UHF) può essere utilizzato per la copertura di piccole aree o come pilota di amplificatori di potenza. Tutte le sue versioni sono fornite in rack 19 2U, e il ripetitore è stato progettato in maniera tale da funzionare in dual mode, con una commutazione tra il funzionamento DVB-T/H e la TV analogica a mezzo comando locale o remoto. L'apparato, totalmente gestito con logica a microcontrollore, permette all'utilizzatore un efficiente controllo locale e remoto dei parametri di funzionamento, tanto da semplificare le attività di installazione e manutenzione. Il display e la tastiera locale rendono possibile la navigazione nei diversi menù, consentendo il controllo totale dell'apparato e l'accesso ad un capiente storico degli allarmi. L'accesso remoto è disponibile tramite le interfacce di comunicazione RS485, RS232 e Ethernet (WEB server e agente SNMP) per una semplice integrazione in una moderna rete di supervisione.

The translator is a device that can have wide applications in the design and implementation of DVB-T/DVB-H coverage networks. Teko Telecom Translator provides effective solutions to meet the network operator renewed requirements. Its main feature is the frequency agility: the Up and Down conversion circuits philosophy and the input and output filters absence make the equipment able to be quickly configured to different channels. Thanks to an innovative system of detection of standard modulation, the repeater of the Agile series is able to automatically set itself as analogical or digital repeater, according to the type of incoming signal. This functionality allows to easily manage the transitino from the analogical TV to the digital broadcasting (swichover), as well as the experimental phases. Its input stage (covering the whole 50-860 MHz frequency band) with extended dynamic range and high linearity, combined with the digital IF filter (Pat.Pend. BO2004A 000487), allows the operator to efficiently and dynamically handle the most demanding radio coverage requirements. The use of the digital IF filter reduces the time delay and allows a precise and efficient selectivity adjustment, while the group and amplitude delay equalizer allows to compensate the distortions introduced by output power filters. With output power up to 0.1W (operating on the whole 50-860MHz frequency band) and 1W (operating in VHF or UHF band), it can be used for covering small areas or as a driver for power amplifiers. All configurations are supplied in a compact 2U 19" rack, and the translator is designed to operate in dual mode, switching on site or by remote control, between analog TV and DVB-T/H operating modes. The equipment, fully managed with micro-controller logic, allows the user an efficient operating parameters local and remote control and this makes both the installation and maintenance activities simplified. The local display and keyboard allow the user to navigate all operation menus with total control over the translator and access to generously dimensioned alarm history files. The RS485, RS232 and Ethernet (WEB server and SNMP agent) remote interfaces make its integration in a modern supervisory network easy.

DVB-T DVB-H Translator

- *Agilità in frequenza*
- *Elevata dinamica di ingresso*
- *Basso ritardo di gruppo*
- *Totalmente supervisionato*
- *Semplicità di installazione*
- *Funzionamento dual mode (analogico e digitale)*

- *Frequency agility*
- *High performance front-end*
- *Reduced time delay*
- *Fully managed*
- *Easy to install*
- *Dual mode operation (analog Tv and DVB-T/H)*

DVB-T DVB-H

DVB-T/H TRANSLATOR CHARACTERISTICS (also used for DAB B.III application)	
Input connector	N (f) 50 Ohm
Input operating frequency	50 to 860 MHz
Input return loss	≥18dB
Minimum input signal level	-80 dBm
Maximum input signal level	-20 dBm
Input to output delay	2µs approx
Clock reference input connector / frequency / level	BNC 50 Ohm / 10 MHz / 0 ÷ –12dBm
Output connector	N (f) 50 Ohm
RF Output power	0.1 Wrms to 1 Wrms (according to version)
Output power stability	≤±0.5dB
Output return loss	≥18dB
Output operating frequencies	50 to 860 MHz (0.1Wrms output power); VHF band III (1Wrms output power); UHF (1Wrms output power)
Frequency stability (internal reference)	≤0.1 ppm/Year
Channel bandwidth	6, 7, 8 MHz (other BW on request)
Noise figure	≤5 dB
Amplitude pre-equalization range	±3 dB
Group delay pre-equalization range	±500 ns
M.E.R. with precorrector	≥35 dB (input MER >40dB)
Shoulder attenuation with precorrector	≥38 dB (input shoulder attenuation ≥48 dB)
Spectral purity @ 10 Hz	≤-65 dBc
Spectral purity @ 100 Hz	≤-85 dBc
Spectral purity @ 1000 Hz	≤-85 dBc
Spectral purity @ 10 kHz	≤-95 dBc
Operating temperature	-5° C to +45 °C
Operating environment relative humidity	up to 95%
Supply voltage range (nominal)	100 to 240 Vac 50 to 60 Hz
Power consumption	≤125 VA, PF> 0.9
Cooling system	natural ventilation
Dimensions	19" - 2U rack, depth: 475 mm(0.1Wrms) – 534mm (1Wrms)
Weight	8kg approx
Remote Interface	TC / TS contacts, RS485 – RS232 (web server or SNMP on request)

DVB-T DVB-H Translator

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TV POWER DIVIDERS
TV ACCESSORIES

All power dividers are characterized by wide operating frequency ranges in VHF or UHF band, available for different output powers. They can be available for different output powers. They can be supplied with any connector or flange, according to users requirements and for every need regarding the number of output. They are made in aluminum treated under the worst weather conditions.

2-WAY POWER DIVIDER VHF (175-230 Mhz)

CODE	MODEL	INPUT CONNECTOR	OUTPUT CONNECTOR	MAX INPUT POWER (dB)
0000170502	PDV2-S/N 2 ways	N		400
0000170528	PDV2-S/N 2 ways	7/16	N	800
0000170501	PDV2-S/S 2 ways	7/16		1000
0000170500	PDV2-F/S 2 ways	7/8	7/16	2000
0000170529	PDV2-Y/F 2 ways	1-5/8	7/8	4000
0000170530	PDV2-Z/Y 2 ways	3-1/8	1-5/8	8000

3-WAY POWER DIVIDER VHF (175-230 Mhz)

CODE	MODEL	INPUT CONNECTOR	OUTPUT CONNECTOR	MAX INPUT POWER (dB)
0000170531	PDV3-S/N 3 ways	7/16	N	1000
0000170532	PDV3-S/S 3 ways	7/16		1000
0000170533	PDV3-F/S 3 ways	7/8	7/16	2500
0000170534	PDV3-Y/F 3 ways	1-5/8	7/8	5000

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4-WAY POWER DIVIDER VHF (175-230 Mhz)

CODE	MODEL	INPUT CONNECTOR	OUTPUT CONNECTOR	MAX INPUT POWER (dB)
0000170498	PDV4-S/N 4 ways	7/16	N	1000
0000170526	PDV4-F/S 4 ways	7/8	N	1600
0000170497	PDV4-S/S 4 ways	7/16		1000
0000170491	PDV4-F/S 4 ways	7/8	7/16	2500
0000170519	PDV4-F/F 4 ways	7/8		2500
0000170492	PDV4-Y/F 4ways	1-5/8	7/8	5000
0000170520	PDV4-Z/F 4ways	3-1/8	7/8	10000

2-WAY POWER DIVIDER UHF (470-860 Mhz)

CODE	MODEL	INPUT CONNECTOR	OUTPUT CONNECTOR	MAX INPUT POWER (dB)
0000170505	PDU2-N/N 2 ways	N		400
0000170535	PDU2-S/N 2 ways	7/16	N	1000
0000170503	PDU2-S/S 2 ways	7/16		1600
0000170536	PDU2-F/S 2 ways	7/8	7/16	2500
0000170504	PDU2-F/F 2 ways	7/8		2500
0000170334	PDU2-Y/F 2 ways	1-5/8	7/8	5000
0000170537	PDU2-Z/Y 2 ways	3-1/8	7/8	10000

3-WAY POWER DIVIDER UHF (470-860 Mhz)

CODE	MODEL	INPUT CONNECTOR	OUTPUT CONNECTOR	MAX INPUT POWER (dB)
0000170506	PDU3-S/N 3 ways	7/16	N	1000
0000170538	PDU3-S/S 3 ways	7/16		1000
0000170507	PDU3-F/S 3 ways	7/8	7/16	2500
0000170539	PDU3-Y/F 3 ways	1-5/8	7/8	5000
0000170540	PDU3-Z/Y 3 ways	3-1/8	1-5/8	10000

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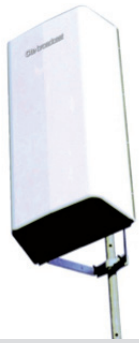
4-WAY POWER DIVIDER UHF (470-860 Mhz)

CODE	MODEL	INPUT CONNECTOR	OUTPUT CONNECTOR	MAX INPUT POWER (dB)
0000170521	PDU4-S/N 4 ways	7/16	N	1000
0000170539	PDU4-S/S 4 ways	7/16		1000
0000170389	PDU4-F/S 4 ways	7/8	7/16	2500
0000170523	PDU4-F/F 4 ways	7/8		2500
0002460005	PDU4-Y/F 4ways	1-5/8	7/8	5000
0000170524	PDU4-Z/F 4ways	3-1/8	7/8	10000
0000170525	PDU4-Z/Y 4ways	3-1/8	7/8	10000

UHF PANEL ANTENNA
TV ACCESSORIES



The UHF directional wide-band antenna PTU is designed for horizontal or vertical polarization transmitting TV systems. The antenna is composed of eight half-wave dipoles antenna with panel reflector and protection radome. The PTU antenna is suitable for UHF low, medium, and high power stacked-array systems for directional, semidirectional and omnidirectional patterns. On a back side there is a coaxial antenna connector 7/16 (N female or EIA 7/8 upon request) . The PTU antenna is supplied with a standard mounting system; a professional mounting kit is available as an option.

THECNICAL DATA	
RF Input power	300-1000-2000 W
Input Connector	N-7/16-7/8
Polarization	Horizontal
Weight	14Kg
Gain (Referred to Half-Wave Dipole)	11dB
H Plane – V Plane	60°-25°
Max Wind Velocity	225 Km/h
Wind Load (with speed at 150Km/h)	89Kg
Wind Surface	0,65 SQM
Frequency Range	470÷860 MHz
Input Impedance	50Ohm
VSWR	≤1.13:1
Internal parts	Silvered-plated trated copper and brass
External parts	Hot galvanize steel
Mounting	From 60 to 120 mm diam.
Dimension (WxHxD)	450x1000x250

CODE	MODEL	DESCRIPTION
0000170494	PTU/N	UHF Panel with 8 dipole half wave, N type connector
0000170388	PTU/16	UHF Panel with 8 dipole half wave, 7/16 type connector
on request	PTU/F	UHF Panel with 8 dipole half wave, 7/8 type connector

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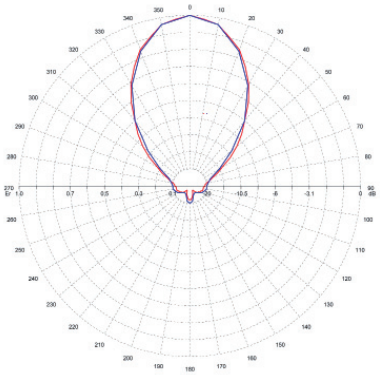
VHF III PANEL ANTENNA
TV ACCESSORIES

These VHF directional wide-band aerials, PTV model, are designed for horizontal or vertical polarization in the transmission for TV and DAB systems. The antenna is composed by two stainless steel dipoles and a reflecting grid realized with hot dip galvanized steel. The PTV model is suitable for the VHF band and can operate in low, medium and high power stacked-array systems, especially for square and round transmitting towers. The PTV antenna can be disassembled to reduce freighting costs.

RADIATION PATTERN

H amplitude — V amplitude

Frequency: 200 MHz



THECNICAL DATA	
RF Input power	1500W
Input Connector	7/16
Polarization	Vertical (or Horizontal)
Weight	25Kg
Gain (Referred to Half-Wave Dipole)	7,5dB
H Plane – V Plane	57°-73°
Max Wind Velocity	225 Km/h
Wind Load (with speed at 150Km/h)	140 Kg
Wind Surface	0,65 SQM
Frequency Range	174÷225 MHz
Input Impedance	50Ohm
VSWR	≤1.4:1
Internal parts	Silvered-plated trated copper and brass
External parts	Stainless steel
Mounting	From 60 to 120 mm diam.
Dimension (WxHxD)	1250x850x400

CODE	MODEL	DESCRIPTION
0000170499	PTV/16	VHF Panel with 2 galvanized steel dipoles, 7/16 type connector

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TV SYSTEM AND FM SYSTEM
SYSTEMS

The Redundant systems are designed to comply with strict requests for a reliable and continuous transmission. Any of our redundant systems is managed by a change over unit that can be friendly set at any time to match the specific characteristics of any transmission system. the change over unit is suitable for different matching and it can be adapted to all our range of products.

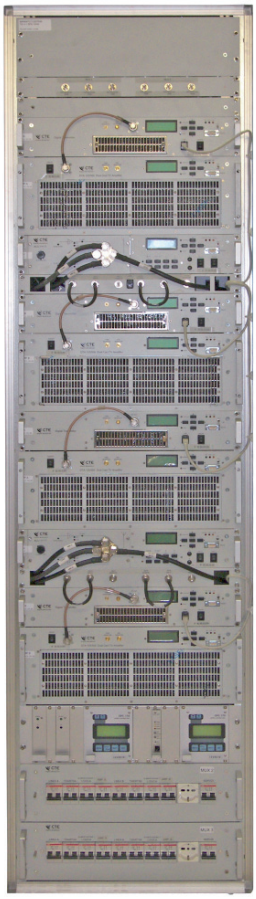
TV SYSTEM

CTE Digital Broadcast systems can be set in cabinets of 19” and 600mm deep, the cooling system is frontal air taking, the equipments stand on guide to permit the autonomous extractability.

Repeater system

The repeater system is managed by the change over unit ACU 1+1 R that allows the effectively management of the transition from analogue TV to digital DVB-T/H standard (thanks to the ability to detect the type of input signal in transit to the repeater and to the configuration versatility of the switching logic).

We can have two type of configurations: pre switch-off and post switch-off.



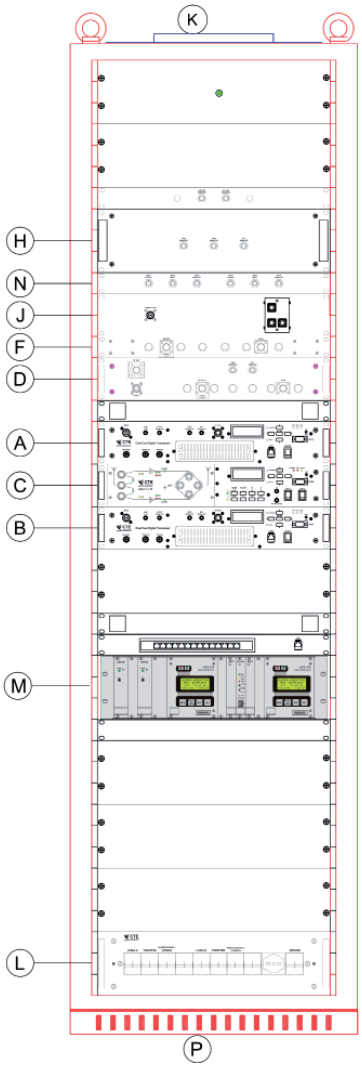
Pre switch-off:

In the system one transposer works with DVB-T/H signal, the other works with analogue signal. The system is able to detect the mode of signal received from the input antenna and consequently it sets the corresponding transposer. The system can be configured with every type of channel in/out combination and it’s possible to receive and transmit either to different or to the same channel. During operation, only one transposer will have the useful TV signal, so it will force the change over unit to commutate its output to the antenna. In pre switch-off configuration the change-over unit [ACU 1+1 R] works only with the transmission four ports relay while the input three ports relay (normally used in the 1+1 configuration) is replaced by a 3 dB hybrid splitter, in this way it is possible to set available simultaneously the input signal to both transposers.

Post switch-off:

The system is configured in 1+1 redundant mode , both transposers work in DVB-T/H mode and one is the reserve for the other. In this mode the redundancy management of transposer is automatic. In this configuration the change-over ACU 1+1 R is configured to work both with transmission four ports coaxial relay and with input three ports relay.

Example of Dual Cast 1+1 Repeater System

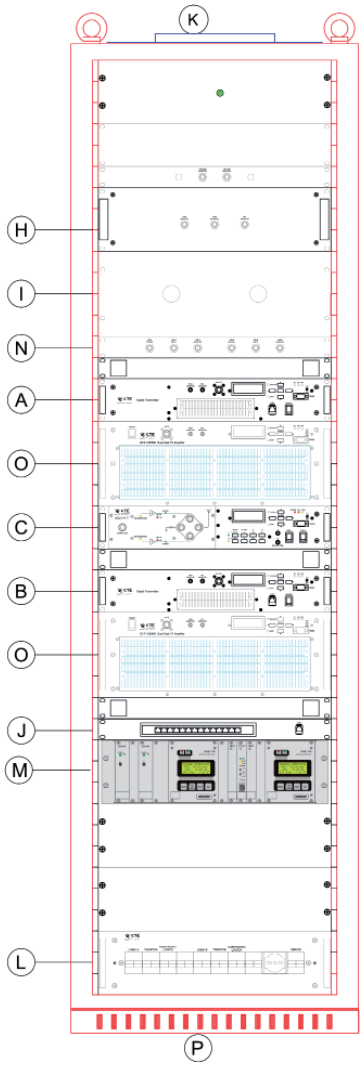


A-B	E25/100- DRU RTX dual-cast 25Wrms/100Wps UHF regenerative
C	ACU 1+1 R exchange logic 1+1 repeater
D	Out filter CL6X30B with directional coupler TV2/MUXA
F	In filter CL6X30B TV2/MUXA
K	Cabinet fan EMB with scoop for TLS and led power
L	Energy panel 230 Vac (lines A-B), wiring to equipment and fan
M	GPS 1+1 mod. GPS170-HQ 1+1 16 OUT
N	Monitory panel ASI
P	Rack 19”-44U deep max 700mm

Transmitter system

The system is composed by two transmitters in 1+1 configuration and one change over unit and works in DVB-T/H mode. The output power can be reduced depending on the network need both locally from LCD or by remote system (web or SNMP). The transmitters are agile in frequency (no manual tuning is needed except external antenna filters). The transmitter can work in MFN or SFN, in hierarchical and non hierarchical mode. The logic (change over unit ACU 1+1) permits the commutation of the main transmitter from the antenna to the dummy load and vice versa, both in automatic and manual mode. The logic detects the transmitter state by means of the telesignals (parallel port) and controls the RF on/off state of transmitters.

Example digital Transmitter 1+1



A-B	E5/10- DRU TX 5Wrms/10Wps UHF
C	ACU 1+1 T exchange logic 1+1 transmitter with unbalanced 75W load
H	output filter
O	DTA 125U 125Wrms UHF Amplifier
I	Relay panel 7/16
J	Switch ethernet
K	Kit fan EMB with scoop for TLS and led power
L	Energy panel 230 Vac (lines A-B), wiring to equipment and fan
M	GPS 1+1 mod. GPS170-HQ 1+1 16 OUT
N	Monitory panel ASI
P	Rack 19”-44U deep max 700mm

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FM SYSTEM

The ACS N+1 is a control unit dedicated to transmission equipment and transponder FM / TV. Its main purpose is to automatically replace the faulty equipment with another equipment with the same features and setting. This changeover is implemented through the coaxial relays. In systems where the receiver is not provided, the receivers coaxial relays are replaced with an Audio Matrix to exchange the baseband. the coaxial relay dedicated to the receivers is not terminated with a standard 50 Ohm load, but with an attenuator connected to the TX1 RF probe that can be used for a testing purposes. This connection does not affect in any way the normal state of the system because it operates only when the reserve system is on standby.

The advantage of this solution are

1. TX reserve can be test on power even when connected to the dummy load, even remotely.

2. test the RX reserve with a confirm of the TS field even remotely

3. In case of switchover , the faulty receiver on the load can be tested in after setting the correct frequency. Reset the frequency after the test. The connection is not mandatory and can be removed at any time.

Example System N+1 TRANSPOSER 4+1

The system's picture used as an example consists of:

1. Input Filter and Splitter: The first block of the system consists of a compact Splitter Star-point that use a triple cavity filters. This block are responsible for filtering and splitting the RF Field signal coming from one or more antennas.

2. Coaxial Relays used for both TX and RX up top 300W are the 4-port ralay.

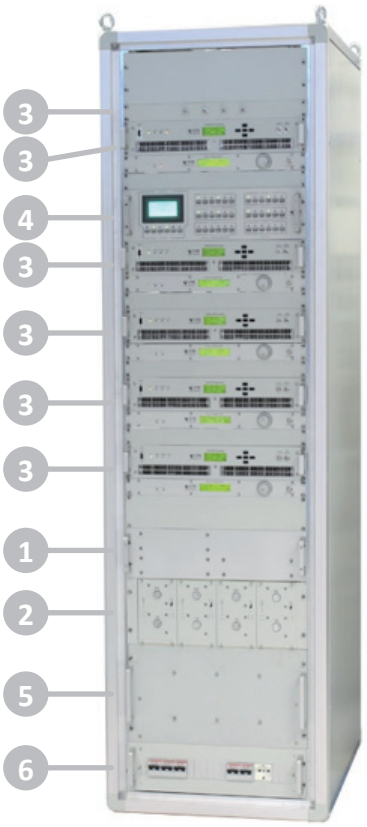
3. Transposer composed by separate Transmitter and Receiver. All transmitters and receivers used in the system are identical and can be exchanged between them. This is made possible by the Frequency Control function available on the TX and RX. Nine Frequency / Power can be memorized on the TX and restored through a contact closure. Nine Frequency can be memorized on the RX and restored through a contact closure. On both TX and RX when no PIN is closed is automatically set the profile "zero". The Frequency Control function is avaiable whet the transmitter is set in Remote mode.

4. Logic ACS N+ 1 :The ACS N+1 is the control unit that supervise the logic states through the TX /RX parallel port and impose all the necessary commands needed for the switchover.

5. Output Combiners : The Output Combiner filters may vary according system configuration. Filters are composed of double, triple or even quadruple cavity when the channel spacing is 500kHz.

6. AC Mains Line Distribution: The AC Mains Line Distribution is contained in a standard 19" 3U and closed with cover protection. In the standard configurations, is usually installed at the base of the cabinet and can be composed until the configuration 6+1. Different models are provided for systems 30W, 300W and 1000W.

7. Monitors & RF DIR REF: The RF monitor is usually installed at the top of the rack with test point for the directional coupler of the Antenna and Dummy Load .



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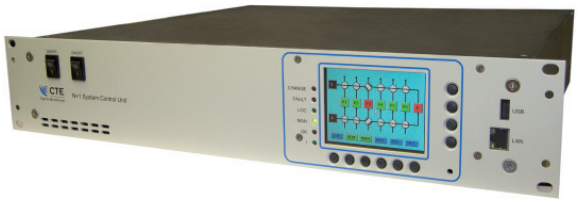
TV SYSTEM AND FM SYSTEM
SYSTEMS

The Transposer used in this systems consists of a separate transmitter, which varies according the power class, and a separate FM receiver that remains the same for any system. This approach has the advantage of being able to migrate from Transposer system to Transmitter system simply removing the Receiver. The connection between the two devices is mainly of two types, the audio connection and the parallel interface connection. When the units are inside the rack this connection is made through the card interface. FM receiver is a agile compact receiver for FM broadcasting band (from 87,5 to 108 MHz) mounted in a 19" standard rack 1U. The FM system in the Application TRANSPOSER N +1 is connected by an Interface board which acts as an hub for all the signals coming from the parallel port of the equipment. Thus links together the ACS N +1, equipment and coaxial relays. It also makes available the TS and TC for the user. All cables used on the rack are PIN to PIN.

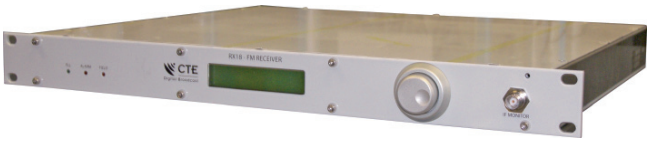
GENERAL DESCRIPTION ACS N+1



This NEW Change-Over unit is designed for management of systems in configurations up to 6+1. By means of a parallel interface, the Change-Over unit constantly monitors different receiving/transmitting parameters of the system, along with the position feedback of the coaxial switches. The definition of the program to be used for the reserve equipment, is implicitly set by the position of the base-band relay switches, and/or by the received RF figure. To provide both local and remote users with accurate information about the operational figures of the monitored units, an Ethernet connection is available at the radio reception end in the system. The local interface is based on graphical touch-screen display, where a clear synoptic view of the monitored system is available. To deploy the remote control function, RS232, parallel interface, SNMP and WEB server are available.

SPECIFICATION	
Power Consumption	Approx less then 50VA
Dimension (WxHxD) mm	485x88x500
Weight	Approx 9.5kg
Nr. of power supply	2
Number of fans	0
Remote control	RS485/Parallel/SNMP/HTTP
Standard compliance	EMC: EN 300-489-1 EN 301-489-14 SAFETY: EN 60950 EN 60215
Operating range	-5/+45°C
Storage range	-10/80°C
Maximum relative humidity	90% non condencing
Max operating altitude	2500m a.s.l.

RX18
FM EQUIPMENT



RX18 is a complete and compact Agile Receiver, synthesized in FM broadcasting band (from 87,5 to 108 MHz), of new generation, housed in a standard 19" 1U rack.

The main features are:

- **No need of calibration** – the internal RF auto-accordant circuits of the receiver allow high performances in the whole band from 87,5 to 108 MHz, with no need of realignment.
- **Excellent RF characteristics** – the high sensitivity and selectivity, the low noise figure and desensitization, as well as the high rejection of intermodulation, make it ideal for areas with high radio frequency levels.
- **Easy to use and fast installation** – thanks to the innovative control panel, equipped with a large LCD display and several intuitive menus, the setting can be easily done. Few turns and clicks by the multifunction knob located on the front panel, and you are ready to operate.
- **Possibility of local and remote control through the parallel interface**.
- **Easy monitoring of the signals and of the internal voltages**. The great number of front and rear connectors allow collecting signals for a wide variety of applications and measures. Furthermore, the LCD display makes visible the figure of the internal power supplies voltages and other parameters, for a quick assistance or control of the operating status.
- **MPX and MONO output** – Suitable both as receiver and receiving section of an FM radio repeater.
- **Optional Decoder Stereo Board**. Possibility to install internally a Stereo Decoder board with "laboratory" features, capable to make available the left and right channels of the stereo signal to the external, without any detectable degradation of the characteristics for monitor use or for the local process.

RF Section		
Frequency	From 87,5 to 108 MHz	
Syntesis step	10KHz	
Noise figure	≤ 1≤ 0	
Modulation	± 75kHz	
Antenna connector	N type (50 Ohm)	
Image frequency suppression	≥60 (typ 70)	
Dynamic selectivity (typ) (Ext. filter recomended)	Δf=300KHz	+10dB
	Δf=400KHz	+35dB
	Δf=500 KHz	+45dB
	Δf=1MHz	+50dB
AM suppression	>45dB	
RF Input Level	From -80dBm to -30dBm (from 10µV to 700mV)	
Sensibility (S/N=60dB)	Mono	-87dBm (10 µV)
	Stereo	-67dBm (100µV)
IF output	dBm	

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MP X/B.F		
Audio/MPX out	From -1,5 to +12 with steps of 0,5dB	
Audio response	From 20 to 15.000 ±0,1dB	
MPX frequency response	From 15 to 15.000 ± 0,1 dB	
MPX frequency response	From 20 to 15.000 ±0,1 dB	
MPX frequency response	From 15 to 67.000 + 0.1/-0.5dB	
Signal to noise ratio (30÷20000Hz RMS)	Mono	≥77dB (typ 82)
	Stereo	≥73dB (typ 75)
Modulation distortion (@ 1KHz 100% modulation)	Mono	≤0,1 % (typ 82)
	Stereo (1 can.)	≤0,30 (Typ 0,20)
Crosstalk stereo (from 100 to 12000Hz)	-45 dB (typ -50)	
Deepmphasis constants	0/25/50/75 µs ±2%	

MECHANICAL AND ELECTRICAL SPECIFICATIONS		
Supply	From 90 to 260 VAC	
	From 50 to 60 Hz	
Operating temperature	Racomanded	From 0 to 35 °C
	Max	From 0 to +45 °C

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TX30 & TX300
FM EQUIPMENT

TX30 and TX 300 are new FM driver/transmitters featuring high reliability, ultimate design solution, friendly use and maintenance, cost-effectiveness. Full normal power is guaranteed in any condition and thanks to the switch mode ac mains power supply (90 to 260 VAC) these transmitters can be installed in any country. The units can be programmed by remote software (web or GSM modem) or used in a N+1 system also by means of a new audio interface with automatic input selection and digital AES/EBU.

FREQUENCY	
Range	87,5÷108MHz
Setting	10KHz steps (by KEY BORAD; GSM; WEB)
Setting Accuracy	+/- 50Hz (internal trimmer)
Generation	PLL synthesizer Microprocessor Controlled
Reference	VCTCX0 12.8 MHz
Ref. Stability Vs Temp.	+/- 200Hz @ (-10+50°C); +/- 300Hz @ (-20+70°C)
Aging VCTCX0	1ppm @ year
Frequency Stability	Better than +/- 300Hz over 3 month
Stability Frequency Deviation	± 2,5% over 6 months

RF OUTPUT SPECIFICATION	
Harmonics suppression	< -75dBc
Spurious Emission	< -90 dBc
Off lock Attenuation	> 60 dBc
S/N RATIO	< 73 dB (according Limit ETSI EN 302 018)
THD	0,10%
VSWR	Less than 1,5:1
Impedance RF	50 Ohm
Test Point	a) BNC connector RF -40dBc b) BNC connector LF (internal MPX)

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MONO/MPX SPECIFICATION	
Mono/MPX Impedance	600 Ohm / 10 K Ohm
Mono Connector	XLR Balanced
MPX Connector	BNC UN-Balanced
MPX Level	From -6 to +12 dBm (rear panel ext. trimmer)
Mono Level	0 dBm; +6dBm; adj.(-6 to +12 dBm, rear panel)
Audio Filter Response	>30 dB (from 19KHz to 100 KHz)
THD	<0,2% from 40Hz to 15KHz
Suppression of 19 KHz	>46 dB
RDS Impedance	10 K Ohm unbalance ., BNC Connector (with 30 HZ to 100 KHz Filter)

STEREO SPECIFICATION	
Left and right impedance	600 ohm/10 KOhm. XLRf Connector
Left, right level	0 dBm; +6dBm; adj.(-6 to +12 dBm, rear panel)
Crosstalk	>50 dB (@ 19KHz)
THD on Encoded channels	<0,3% from 0,4 Hz to 15 KHz
Suppression of 38KHz	>50 dB
Spurious suppression outside band	According to Limit ETSI EN 302 018
Sub Carrier Generation	Internal cristal
Pilot Frequency	19KHz ±1Hz

DESIGN DATA	
Type	Solid state direct FM frequency
Pre-emphasis	Flat or 75 or 50µs
Audio Frequency Response	± 0,2 dB (from 40Hz to 10KHz) (stereo) ±0,3 dB (from 40 Hz to 100 KHz) (MPX)
Unbalance rejection	>40 dB
Modulation	Type: Direct VCO frequency modulation F3E/F8E Capability: Meets or exceeds all CE99/05 R&TTE Requirements
Digital Input	AES/EBU

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TX30 & TX300
FM EQUIPMENT

SPECIFICATION	TX30	TX300
RF output power	From 0 to 30W	From 300W
Output Connector	N type female	N type female
Dimension (WxHxD) mm	2U 482x88x410	2U 482x88x480
Weight	7 Kg	10 Kg
Power Consumption	<100 W	<550 W
Power Factor	0.70	0.99
Power supply req.	From 80 to 265 Vac. Single phase	From 80 to 265 Vac. Single phase
Type of ventilation	1 blower 28 VDC	2 blowers 28 VDC

TEMPERATURE	
Operating range	0° to 45°C
Storage range	-40° to 60° C
Maximum relative Humidity	90% non condensing
Max Operating Altitude	2500 mt.a.s.l.

STANDARD COMPLIANCE	
Conformity	Directive 99/5/CE
Radio Spectrum	ETS 302 018-2 V1.2.1
EMC	ETS 301 489-11 V1.3.1
Safety	EN 60215:1989; EN 60215/A1:1992-07; EN 60215/A2:1994-09;

REMOTE CONTROL	
LAN	Web Browser by TCP/IP SNMP Protocol (RJ45)
RS232	Software Remote Controller by GSM Modem (DB9f)
RS485	Internal BUS connection for system connectivity (DB9 in&out)
Parallel TS & TC	2 x DB15 A I/O
Parallel Frequency Set	9 preset frequency activate by TC (DB15 Connector)

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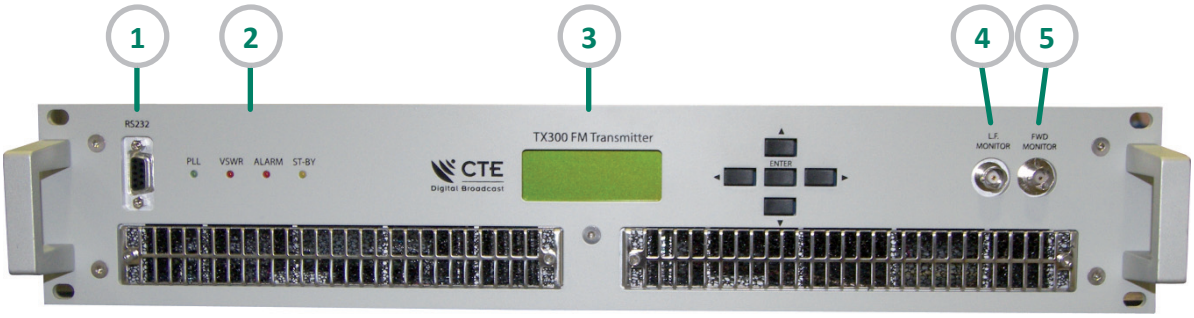
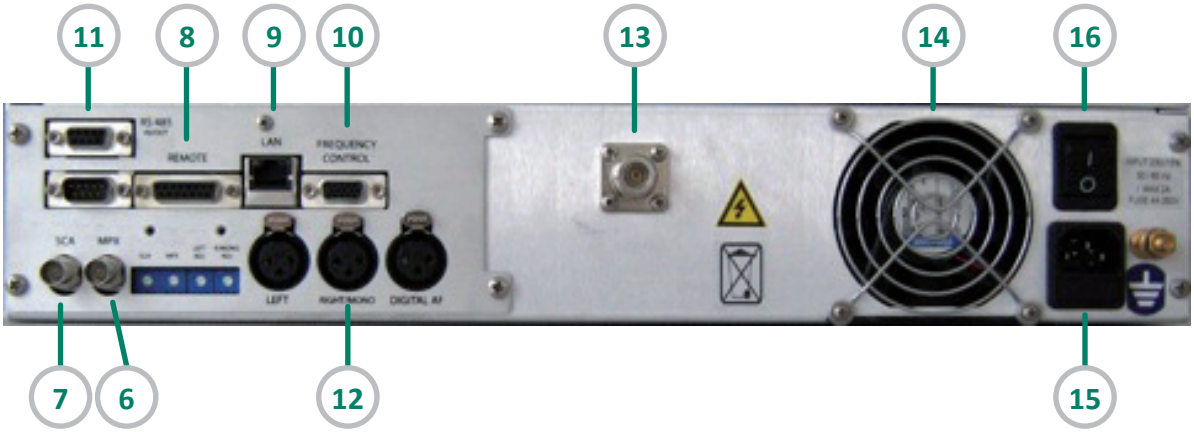
TX30 & TX300
FM EQUIPMENT

FRONT PANEL

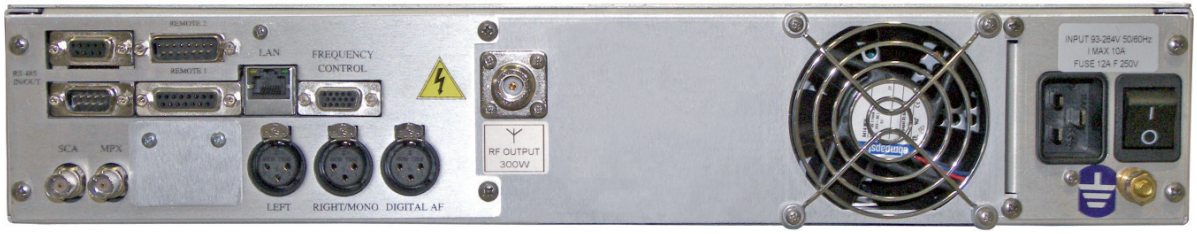


1. RS232 - Usable for software update
2. Status Leds
3. Control Panel
4. LF Monitor
5. FWD Monitor

REAR PANEL 30W



REAR PANEL 300W



6. MPX – input 1 for external RDS/SCA signal
7. SCA- input 1 for external mpx signal
8. Remote control
9. LAN – Ethernet standard
10. FREQUENCY CONTROL
11. RS485
12. External Input
13. Antenna N female output connector
14. Cooling
15. Power line plug-in FUSE
16. Power line Switch

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CODE	MODEL	DESCRIPTION	OPTIONS
6003545048	TX30	30W Stereo, Mono MPX FM Transmitter	Option A
6003545049	TX30	30W Stereo, Mono MPX FM Transmitter	Option A+B
6003545050	TX30	30W Stereo, Mono MPX FM Transmitter	Option A+C
6003545051	TX30	30W Stereo, Mono MPX FM Transmitter	Option A+B+C
6003545052	TX300	300W Stereo, Mono MPX FM Transmitter	Option A
6003545053	TX300	300W Stereo, Mono MPX FM Transmitter	Option A+B
6003545054	TX300	300W Stereo, Mono MPX FM Transmitter	Option A+C
6003545055	TX300	300W Stereo, Mono MPX FM Transmitter	Option A+B+C

OPTION A:	Remote Control (TCP/IP; SNMP; RS232)
OPTION B:	Built in Digital AES/EBU Decoder
OPTION C:	DB25 Parallel port expansion for 1+1, N+1 system, ext C.U.

TX1 - TX05 & VL1 - VL05

FM EQUIPMENT

The TX 1 and TX 5 are really innovative FM Transmitters with 1000W and 500W output power respectively. Thanks to the new solutions that our engineers have implemented in the circuitry and to the compact design, for these transmitters we have estimated a 20% longer MTBF with respect to the average similar models available in the market. The TX 1 and TX 5 are equipped with a microprocessor board that allows the programming locally or remotely by web (SNMP protocol). Thanks to the ultimate electronic components that have been largely implemented in the design, the overall specifications now achieved, set TX1 and TX 05 as “top class equipment”.

FREQUENCY	
Range	87,5÷108MHz
Setting	10KHz steps (by KEY BORAD; GSM; WEB)
Setting Accuracy	+/- 50Hz (internal trimmer)
Generation	PLL synthesizer Microprocessor Controlled
Reference	VCTCX0 12.8 MHz
Ref. Stability Vs Temp.	+/- 200Hz @ (-10+50°C); +/- 300Hz @ (-20+70°C)
Aging VCTCX0	1ppm @ year
Frequency Stability	Better than +/- 300Hz over 3 month
Stability Frequency Deviation	± 2,5% over 6 months

RF OUTPUT SPECIFICATION	
Harmonics suppression	< -75dBc
Spurious Emission	< -90 dBc
Off lock Attenuation	> 60 dBc
S/N RATIO	< 73 dB (according Limit ETSI EN 302 018)
THD	0,10%
VSWR	Less than 1,5:1
Impedance RF	50 Ohm
Test Point	a) BNC connector RF -40dBc b) BNC connector LF (internal MPX)

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MONO/MPX SPECIFICATION	
Mono/MPX Impedance	600 Ohm / 10 K Ohm
Mono Connector	XLR Balanced
MPX Connector	BNC UN-Balanced
MPX Level	From -6 to +12 dBm (rear panel ext. trimmer)
Mono Level	0 dBm; +6dBm; adj.(-6 to +12 dBm, rear panel)
Audio Filter Response	>30 dB (from 19KHz to 100 KHz)
THD	<0,2% from 40Hz to 15KHz
Suppression of 19 KHz	>46 dB
RDS Impedance	10 K Ohm unbalance ., BNC Connector (with 30 HZ to 100 KHz Filter

STEREO SPECIFICATION	
Left and right impedance	600 ohm/10 KOhm. XLRf Connector
Left, right level	0 dBm; +6dBm; adj.(-6 to +12 dBm, rear panel)
Crosstalk	>50 dB (@ 19KHz)
THD on Encoded channels	<0,3% from 0,4 Hz to 15 KHz
Suppression of 38KHz	>50 dB
Spurious suppression outside band	According to Limit ETSI EN 302 018)
Sub Carrier Generation	Internal cristal
Pilot Frequency	19KHz ±1Hz

DESIGN DATA	
Type	Solid state direct FM frequency
Pre-emphasis	Flat or 75 or 50µs
Audio Frequency Response	± 0,2 dB (from 40Hz to 10KHz) (stereo) ±0,3 dB (from 40 Hz to 100 KHz) (MPX)
Unbalance rejection	>40 dB
Modulation	Type: Direct VCO frequency modulation F3E/F8E Capability: Meets or exceeds all CE99/05 R&TTE Requirements
Digital Input	AES/EBU

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TX1 - TX05 & VL1 - VL05
FM EQUIPMENT

SPECIFICATION	TX1/ VL1	TX 05/VL 05
RF output power	From 100 to 1000W	From 50 to 500W
Output Connector	7/16 type female	7/16 type female
Dimension (WxHxD) mm	3U 482x132x700	3U 482x132x700
Weight	22/21 Kg	21/20 Kg
Power Consumption	1700 W	900 W
Power Factor	0.97	0.99
Nr. of power supply boards	230 Vac. ± 15% Single phase	230 Vac. ± 15% Single phase
Type of ventilation	2 blower 26V DC	2 blowers 26V DC

TEMPERATURE	
Operating range	0° to 45°C
Storage range	-40° to 60° C
Maximum relative Humidity	90% non condensing
Max Operating Altitude	2500 mt.a.s.l.

STANDARD COMPLIANCE	
Conformity	Directive 99/5/CE
Radio Spectrum	ETS 302 018-2 V1.2.1
EMC	ETS 301 489-11 V1.3.1
Safety	EN 60215:1989; EN 60215/A1:1992-07; EN 60215/A2:1994-09;

REMOTE CONTROL	
LAN	Web Browser by TCP/IP SNMP Protocol (RJ45)
RS232	Software Remote Controller by GSM Modem (DB9f)
RS485	Internal BUS connection for system connectivity (DB9 in&out)
Parallel TS & TC	2 x DB15 A I/O
Parallel Frequency Set	9 preset frequency activate by TC (DB15 Connector)

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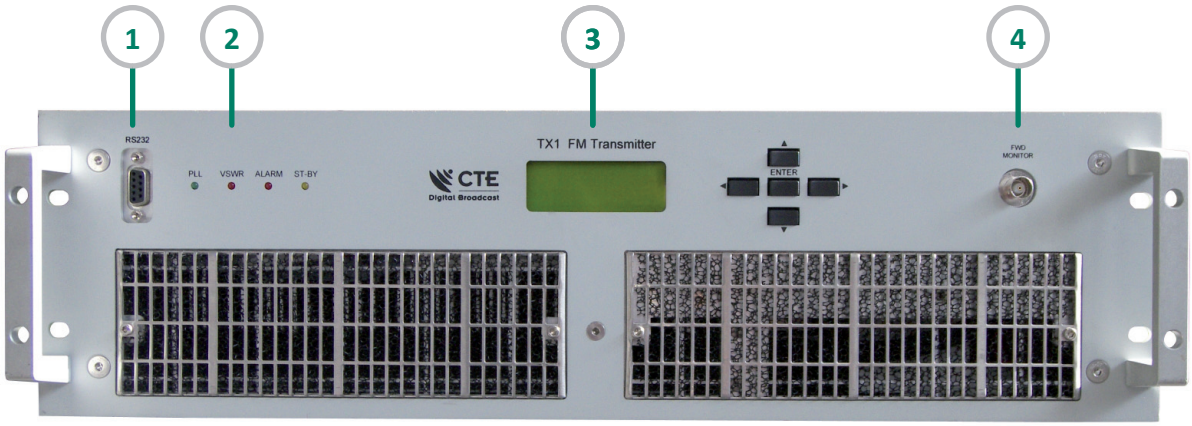
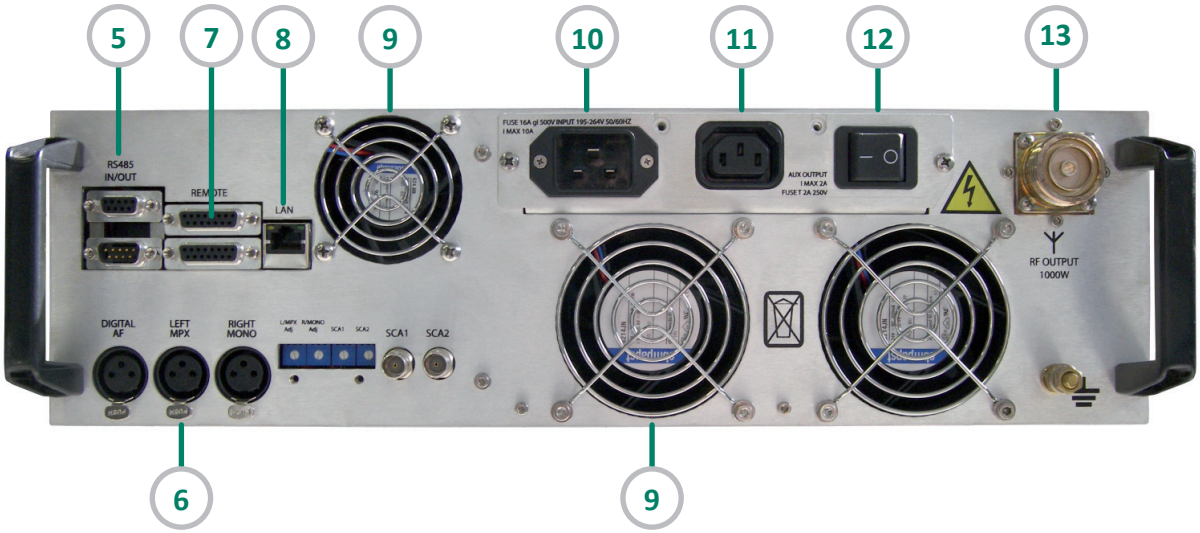
TX1 - TX05 & VL1 - VL05
FM EQUIPMENT

FRONT PANEL TX1 - TX05



1. RS 232 PC Connection
2. Status Led
3. Control Panel
4. FWD Monitor

REAR PANEL TX1 - TX05



5. RS485 Serial port
6. Modulation connection area
7. Remote control DB15 Female
8. input for LAN connection
9. Cooling fans
10. Power line plug in with fuse
11. Auxiliary AC output power
12. AC power switch
13. RF output 1000W

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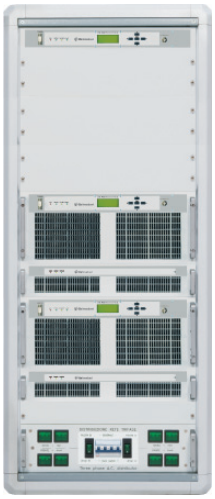
TX1 - TX05 & VL1 - VL05
FM EQUIPMENT

CODE	MODEL	DESCRIPTION
6003545060	TX05 Option A	500W Stereo,Mono, MPX FM Transmitter
6003545061	TX05 Option A+B	500W Stereo,Mono, MPX FM Transmitter
6003545062	TX05 Option A+C	500W Stereo,Mono, MPX FM Transmitter
6003545063	TX05 Option A+B+C	500W Stereo,Mono, MPX FM Transmitter
6003545056	TX1 Option A	1000W Stereo,Mono, MPX FM Transmitter
6003545057	TX1 Option A+B	1000W Stereo,Mono, MPX FM Transmitter
6003545058	TX1 Option A+C	1000W Stereo,Mono, MPX FM Transmitter
6003545059	TX1 Option A+B+C	1000W Stereo,Mono, MPX FM Transmitter
6000545055	VL 05 Option A	500W Power Amplifier 87.5-108MHz
6000545054	VL 1 Option A	1KW Power Amplifier 87.5-108MHz

OPTION A:	Remote Control (TCP/IP; SNMP, RS232)
OPTION B:	Built in Digital AES/EBU Decoder
OPTION C:	DB25 paralel port expansion for 1+1, N+1 system, ext C.U

VL3 - VL5 - VL10
FM EQUIPMENT



This innovative and compact amplifier is able to satisfy the strictest request of all end-users who are looking for high reliable and top quality equipment at competitive prices. All the declared operational parameters are assured in the entire frequency range and for extreme environmental conditions. By means of the advance approach in the design focused on low power consumption and linearity over the entire operative band, we estimate a 20% longer MTBF with respect to the average standard equipment available in the market.

RF OUTPUT SPECIFICATION	VL3	VL5-VL10
Range	87,5÷108 MHz	
Overall efficiency	Better than 58%	
Impedance RF connector	50ohm input and output	
Output power stability	±3%	
Harmonics suppression	≥-80 dBc (typically better than 90 dBc)	
Spurious emission	< according Limit ETSI EN 302 018	
Residual Asynchrony AM	-74 dB Weighed	
Residual Synchrony AM	-58 dB Weighed	
Probe	BNC connector RF -60 dBc	
Protections	RF amplifier module over-temperature 70° Excessive reflected power Permissible VSWR≤ 1.5	Overeating 45°C Over charge / Short circuit Excessive VSWR
Programmable logic protection	Stopping of unit after 8 alarms Stopping of the unit after 16 alams	-
Logic protections reset	Manual, remote or automatically every 24 hours	-
Controls	Mains-dB 15 Connector (Stand-by and Reset command)	-
Alarm	Excessive output SWR (red led) 50W adj. – Alarm (red led)- Stand-by (yellow led)- Mains- DCout -ALC	-

POWER SUPPLY	VL3	VL5-VL10
Type	Switch mode (double conversion voltage direct mains)	
Settings	Single phase; Mono Phase by internal jumper	-

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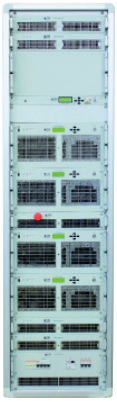
VL3 - VL5 - VL10
FM EQUIPMENT



SPECIFICATION	VL3	VL5	VL10
RF output power	2500W	5KW	10KW
Nr. Of transistor	8 MOS-FET SD 2942	16 MOS-FET SD 2942	32 MOS-FET SD 2942
RF Input (Nominal Level)	40W - 60W	80W - 120W	250W - 300W
Output Connector	7/8 EIA	1-5/8 EIA	
Dimension (WxHxD) mm	5U+2U 482x220x700 482x88x700	30U/44U 540X1380X1000	44U 540X2000X1000
Weight	54 Kg	255 Kg	500 Kg
Power consumption	4300 W	8100 W	17900 W
Power supply req.	Three-phase 380 Vac±15% / 230 Vac mono-phase	Three-phase 380 Vac±15%	
Nr. of power supply boards	3	6	12
Number of fans	2 blowers for each PA & PS module		
Nominal air volume	740 m3/min	1440 m3/min	2920 m3/min

TEMPERATURE	
Operating range	0° to 45°C
Storage range	-40° to 70° C
Maximum relative Humidity	90% @26°C non condensing
Max Operating Altitude	2500 mt.a.s.l.

STANDARD COMPLIANCE	
Conformity	Directive 99/5/CE
Radio Spectrum	ETS 302 018-2 V1.2.1
EMC	ETS 301 489-11 V1.3.1
Safety	EN 60215:1989; EN 60215/A1:1992-07; EN 60215/A2:1994-09;

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VL3 - VL5 - VL10
FM EQUIPMENT

REMOTE CONTROL	
LAN	Web Browser by TCP/IP SNMP Protocol (RJ45)
RS232	Software Remote Controller by GSM Modem (DB9f)
RS485	Internal BUS connection for system connectivity (DB9 in&out)
Parallel TS & TC	2 x DB15 A I/O

CODE	MODEL	DESCRIPTION	OPTIONS
6000545058	**VL3**	2,5 Kw Power Amplifier 87.5-108 MHz	-
8001400001	**VL5**	5Kw Power Amplifier 87.5-108 MHz	30U cabinet Included
8001400002	**VL5**	5 Kw Power Amplifier 87.5-108Mhz	42U Cabinet Included
8001400003	**VL5**	5Kw Powre Amplifier 87.5-108MHz	42U Cabinet Included + Fan
8001400004	**VL10**	10Kw Power Amplifier 87.5-108 MHz	42U cabinet Included + Fan

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FM ANALOGUE LINKS & TRANSPOSER

FM EQUIPMENT

The general purpose of this FM radio transposer TRC series, is rebroadcast the signals in the same FM band granting an effective coverage for all those areas where RF signal is too weak.

This equipment can be provides at three output power figures and broadcast quality. A complete electrical shield separates the transmitting and receiving sections, thus avoiding undesired mutual interactions. All the circuitres have been designed according to “modularity concept”, to grant easy quick mainteniance this concept also allows using the equipments as single receiver or single transmitter, since the connection between these two sections is externally placed and accessible by BNC connectors. Both sections can be remotely controlled via RS232 port. In the design of the TRC series transposer, a special attentionhas been devoted to the consumption aspect: AC-DC switch-mode power supplies have been therefore implemented, with PFC (Power Factor Connector) to drastically reduce the absorption of reactive power.

FREQUENCY	
Modulation	Solid state direct FM frequency synthesized crystal ref. thermal compensated
Range setting	87,5-108 MHz Directly digitally programmable on the front panle in 10kHz steps
Fine frequency Adjustment	Internal trimmer

RF OUTPUT SPECIFICATION VIDEO PERFORMANCE	
Harmonic suppression	< -65 dBc
Spurious Emission	< -80 dBc
Residual Asynchrony AM	> 60 dB Weighed
Residual Synchrony AM	> 60 dB Weighed
S/N RATIO (weighted)	> 70 dB (referred to ± 75kHz)
Distortion	0.1% for 75kHz FM deviation
Probe	BNC RF test

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FM ANALOGUE LINKS & TRANSPOSER
FM EQUIPMENT

AUDIO SPECIFICATION	
Mono/MPX	BNC 2k Ohm
SCA	3 x BNC f
Mono/MPX SCA Level	From 0 to + 12 dBm
Stereo separation	> 55dB@1Khz dBm

RECEIVER SPECIFICATION	
Selectivity Static	3dB@ ± 150kHz; 70 dB @ ± 600KHz
Selectivity Dynamic	± 300 KHz @ + 5 dB ± 400 KHz @ + 25 dB ± 500 KHz @ + 30 dB
Sensitivity Mono (deviation ± 75 KHz)	15 mV (S/N = 60 dB with bandwidth = 30 ÷ 15 KHz decoded, de-emphasis)
Setting	Frequency from front panel display, 10 kz step. Input filter by standard procedure

DESIGNED DATA	
Displayer Meter	Frequency, power output, voltage, lock, input level meter, input level set, carrier enable, temperature alarm set, -3dB power down alarm set
Protections	Alarm frequency programming error, Local oscillator locked in- heat sink temperature exceeds that set- RF output power below2,5W (TX version) – RF output power below squelch threshold (RX version) – Power supply voltage of a module outside the permitted range

REMOTE CONTROL	
Output connector	DB9 connectors RX: RS232 signal; TX: RS232 signal

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FM ANALOGUE LINKS & TRANSPOSER
FM EQUIPMENT

STANDARDS COMPLIANCE	
Radio Spectrum EMC	ETSI 300-384 ETSI 449, ETS-339, ETS-384, CCIR-450, CCIR-412, CCIR-559, CCIR-468
Safety R&TTE	EN 60950 – EN 60215 Declaration of Conformity with regards to the Directive 199/5/EC

TEMPERATURE	
Nominal range	0° to 45° (Meets ETS 300 019 requirements)
Storage range	-30° to 50°
Maximum relative Humidity	90% non condensing
Max Operating Altitude	2500mt a.s.l.

SPECIFICATION	TRC-5530	TRC-55100	TRC-55250
RF output power	30W	100W	250W
Output Connector	N type female 50 Ohm	N type female	N type female 50 Ohm
Dimension (WxHxD) mm	482 x 132 x 380		
Weight	3,5Kg		
Power consumption	Approx. <120 VA	Approx. <160VA	Approx.< 260VA
Power supply Req.	100÷240 Vac : 47 ÷ 63 Hz		
Cooling	Forced Air		

CODE	MODEL	DESCRIPTION
0005320003	**TRC-5530**	30W FM Transposer
0005320004	**TRC-55100**	100W FM Transposer
0005320005	**TRC-55250**	250W FM Transposer

ACS N+1
TV AND FM EQUIPMENT

This NEW Change-Over unit is designed for management of systems in configurations up to 6+1. By means of a parallel interface, the Change-Over unit constantly monitors different receiving/transmitting parameters of the system, along with the position feedback of the coaxial switches. The definition of the program to be used for the reserve equipment, is implicitly set by the position of the base-band relay switches, and/or by the received RF figure. To provide both local and remote users with accurate information about the operational figures of the monitored units, an Ethernet connection is available at the radio reception end in the system. The local interface is based on graphical touch-screen display, where a clear synoptic view of the monitored system is available. To deploy the remote control function, RS232, parallel interface, SNMP and WEB server are available

SPECIFICATION	
Power Consumption	Approx less then 50VA
Dimension (WxHxD) mm	485x88x500
Weight	Approx 9.5kg
Nr. of power supply	2
Number of fans	0
Remote control	RS485/Parallel/SNMP/HTTP
Standard compliance	EMC: EN 300-489-1 EN 301-489-14 SAFETY: EN 60950 EN 60215
Operating range	-5/+45°C
Storage range	-10/80°C
Maximum relative humidity	90% non condencing
Max operating altitude	2500m a.s.l.

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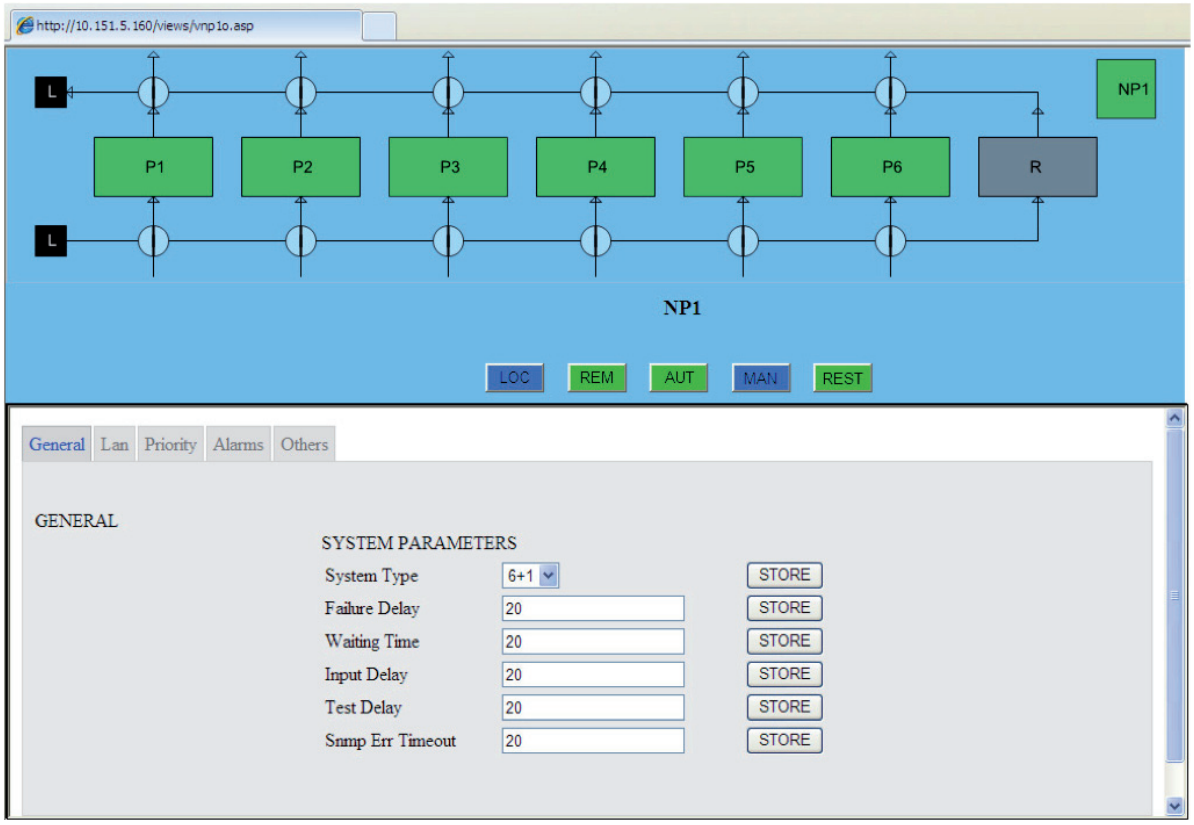
HTML Interface

The Web Interface uses the same synoptic view of the touch screen display



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CAVITY FILTERS
FM ACCESSORIES

The DCF are one-quarter wavelength coaxial cavities, designed and manufactured according to high quality standards conceived for 87,5 ÷108 MHz band. Using a bandpass double cavity installed between transmitter and antenna they drastically reduce spurious signals, besides other intermodulation products. DCF's and TCF's double and triple cavity filters respectively, are provided with rotating knobs to allow easy tuning of the circuit for different sideband attenuation and with a variable coupling.

SPECIFICATIONS	DCF500	DCF1000	DCF2000	DCF3000	DCF5000	DCF10000	TCF3000
RF Input Power	800	1000	2000	3000	5000	10000	3000
Input Connector	N	7/16		7/8		1+5/8	7/8
Output Connector	N	7/16		7/8		1+5/8	7/8
Weight	10Kg	11Kg	18Kg	19Kg	29Kg	40Kg	27Kg
Bandwidth (-3dB)	800KHz			600KHz			500KHz
Typical insertion loss	<0,4dB		<0,3dB		<0,2 dB		From 0,3 to 0,8 dB
Frequency range	87,5÷108 MHz						
Input Impedance	50 Ohm						
VSWR	≤1.15:1						
Internal parts	Silver-plated brass and PTFE						
External parts	Aluminuim						
Colour	Black						
Temperature operating range	From -10°C to +50°C						
Type	double						triple

CODE	MODEL	DESCRIPTION
0000170411	DCF 500	800w Power rate per channel IN/OUT N
0000170601	DCF 1000	1000w Power rate per channel IN/OUT N
0000170019	DCF 2000	2Kw Power rate per channel IN/OUT 7/16"
0000170602	DCF 3000	3Kw Power rate per channel IN/OUT N
0000170412	DCF 5000	5Kw Power rate per channel IN/OUT 7/8"
0000170603	DCF 10000	10Kw Power rate per channel IN/OUT N
0000170488	TCF 3000	3Kw Power rate per channel IN/OUT 7/8"

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STARTPOINT
FM ACCESSORIES

The startpoint combining filters are pre-set in our labs, at the frequency required by the customers. Even at 100% modulation, they assure a good separation for adjacent frequencies up to 2MHz. They are composed of two or more coaxial cavity filters connected to rigid lines all of them equipped with arrow band input lines. Combining systems for low figures of frequency channels separation and high RF power, will be designed on request by our technical department.

SPECIFICATIONS	DSX 1000	DSX 1000H	TTX 500	DSX 2000	TTX 2000	DSX 5000	TTX 5000	QPX 500	QPX 1000
RF Input Power	800	1000	500	2000		5000		500	1000
Input Connector	N	7/16	N	7/16		7/8	1-5/8	N	7/8
Output Connector	7/16		7/8		1-15/8		3-1/8	7/8	1-5/8
Weight	23Kg	28Kg	40Kg	42Kg	60Kg	80Kg	120Kg	47Kg	80Kg
Minimun Frequancy Spacing	2,5MHz			2,2 MHz					
Isolation Between Channels	>30dB			>35dB					
Typical insertion loss	<0,6dB			<0,5dB	<0,4 dB				
Frequency range	87,5÷108 MHz								
Input Impedance	50 Ohm								
VSWR	≤1.2:1								
Internal parts	Silver-plated brass and PTFE								
External parts	Aluminuim								
Colour	Black								
Temperature operating range	From -10°C to +50°C								

CODE	MODEL	DESCRIPTION
0000170421	DSX 1000	Diplexer 800 W power rate per channel IN N, OUT 7/16”
0000170422	DSX 2000	Diplexer 2KW power rate per channel IN 7/16”, OUT 7/8”
0000170423	DSX 5000	Diplexer 4KW power rate per channel IN 7/8” OUT 1-5/8”
0000170509	DPX 2000T	Diplexer 2KW power rate per channel with triple cavity IN 7/16”, OUT 7/8”
0000170424	TTX 500	Triplexer 800W power rate per channel, IN N, OUT 7/8”
0000170425	TTX 2000	Triplexer 2KW power rate per channel, IN 7/8”, OUT 1-5/8”
0000170386	TTX 5000	Triplexer 4KW power rate per channel, IN 1-5/8”, OUT 7/8”
0000170480	QPX 500	Quadriplexer 500 W power rate per channel IN N, OUT 7/8”
0000170483	QPX 1000	Quadriplexer 500 W power rate per channel IN 7/8”, OUT 1-5/8”
ON REQUEST, WE HAVE SPECIAL VERSION FOR LOW CHANNEL SPACING (UP TO 1,5MhZ)		

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DIPLEXER DOUBLE BRIDGE
FM ACCESSORIES

The "double bridge" combining filters allow easy changes to new figures of the operating frequencies. With 100% modulation, they can satisfactory separate two adjacent frequencies up to 2MHz. They are composed of two different double cavity filters and two hybrid couplers, including narrow band and wide band input lines. Low figures of frequency channels separation and high RF power, will be designed on request by our technical department.

SPECIFICATIONS	DPX 1000	DPX 2000	DPX 4000	DPX3-5000	TLX 5000
RF Input Power	800	2000	4000	5000	
Input Connector	N	7/16	7/8		1-5/8
Output Connector	7/16	7/8		1-5/8	3-1/8
Weight	28Kg	58Kg	60Kg	107Kg	230Kg
Minimun Frequency Spacing		2,2MHz		1,5 MHz	2,2MHz
Isolation Between Channels	>30dB	>35dB			
Typical insertion loss	<0,6dB	<0,5dB			<0,4dB
Frequency range	87,5÷108 MHz				
Input Impedance	50 Ohm				
VSWR	≤1.2:1				
Internal parts	Silver-plated brass and PTFE				
External parts	Aluminuim				
Colour	Black				
Temperature operating range	From -10°C to +50°C				
Cavity Type	Double		Triple		

CODE	MODEL	DESCRIPTION
0000170421	DPX1000	Diplexer Double Bridge 800W Power rate per channel, IN N, OUT 7/16"
0000170422	DPX2000	Diplexer Double Bridge 2KW Power rate per channel, IN 7/16", OUT 7/8"
0000170423	DPX4000	Diplexer Double Bridge 4KW Power rate per channel, IN 7/8", OUT 1+5/8"
0000170509	DPX3-5000	Diplexer Double Bridge 5KW Power rate per channel with triple cavity, IN 7/8", OUT 1+5/8"

FM POWER DIVIDER
FM ACCESSORIES

These power dividers are available for any RF output power with 50ohm impedance (or 75ohm request). They can be supplied with any connector or flange, according to user requirements and for every need regarding the number of outputs. Our power dividers are broadband from 87,5 to 108 MHz and 22 MHz bandwidth. The typical insertion loss is from 0,2 to 0,5 dB with alodyne with insulator in PTFE and o-ring type washers; the body of the device is treated and covered by a special paint for life duration in any climate conditions. Power dividers for other frequency ranges are available upon request.

2-WAY POWER DIVIDER VHF II

CODE	MODEL	INPUT CONNECTOR	OUTPUT CONNECTOR	MAX INPUT POWER (W)
0000170004	PD2-N/N (one single step)	N		800
0000170352	PD2-S/N (one single step)	7/16	N	1600
0000170054	PD2-S/S 2 (one single step)	7/16		2000
0000170460	PD2-F/N	7/8	N	1600
0000170458	PD2-F/S	7/8	7/16	4000
0000170459	PD2-F/F	7/8		5000
0000170406	PD2-Y/S	1+5/8	7/16	4000
0000170416	PD2-Y/F	1+5/8	7/8	10000
0000170407	PD2-Z/Y	3+1/8	1+5/8	20000

3-WAY POWER DIVIDER VHF II

CODE	MODEL	INPUT CONNECTOR	OUTPUT CONNECTOR	MAX INPUT POWER (dB)
0000170446	PD3-N/N (one single step)	N		800
0000170451	PD3-S/N (one single step)	7/16	N	2000
0000170452	PD3-F/N (one single step)	7/8	N	2400
0000170453	PD3-F/S	7/8	7/16	5000
0000170454	PD3-F/F	7/8		5000
0000170455	PD3-Y/S	1+5/8	7/16	6000
0000170408	PD3-Y/F	1+5/8	7/8	10000

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FM POWER DIVIDER
FM ACCESSORIES

4-WAY POWER DIVIDER VHF II

CODE	MODEL	INPUT CONNECTOR	OUTPUT CONNECTOR	MAX INPUT POWER (dB)
0000170005	PD4-N/N (one single step)	N		1000
0000170024	PD4-S/N	7/16	N	2000
0000170403	PD4-S/S (one single step)	7/16		2000
0000170450	PD4-F/N	7/8	N	3200
0000170055	PD4-F/S	7/8	7/16	5000
0000170460	PD4-F/F	7/8		5000
0000170017	PD4-Y/S	1+5/8	7/16	8000
0000170408	PD4-Y/F	1+5/8	7/8	10000

6-WAY POWER DIVIDER VHF II

CODE	MODEL	INPUT CONNECTOR	OUTPUT CONNECTOR	MAX INPUT POWER (dB)
0000170022	PD6-S/N	7/16	N	2000
0000170409	PD6-F/N	7/8	N	4800
0000170018	PD6-F/S	7/8	7/16	5000
0000170410	PD6-F/F	7/8		5000
0000170437	PD6-Y/S	1+5/8	7/16	10000
0000170460	PD6-Y/F	1+5/8	7/8	10000

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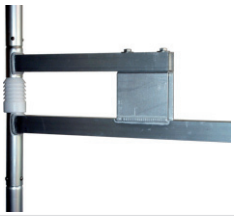
FM DIPOLE ANTENNAS
FM ACCESSORIES

PLS1

DIP11

DIP15

DIP13



These dipole antennas are rugged broadband aerials especially designed for arrays composed of several elements. The dipole is made of hot galvanized steel to provide high corrosion resistance, for a lifetime duration and operation in any climate conditions. A thick internal ground connection across the feeding line assures heavy duty service and protection in case of lightning. The design of the internal lines and PTFE insulator provide reliability and long lasting operation for power ratings up to 1500W on the DIP11 model, and up to 5000W on the DIP15 model. The aluminium dipole PLS1 model is a smart, effective and budget solution. An accurate testing process is carried out at factory on each of these dipoles to control the compliance to all the stated figures.

SPECIFICATIONS	PLS1	DIP11	DIP13	DIP15
RF Input Power	500W	800-2kW-3kW	800-2kW	5kW
Input Connector	N	N-7/16-7/8	N-7/16	7/8
Polarization	Vertical			
Weight	4Kg	7Kg	4Kg	16Kg
Gain (Referred to half-wave Dipole)	2dB			
H Plane-V Plane	180°-78°			
Max Wind Velocity	150Km/h			
Wind load (with speed at 150Km/h)	10Kgs	18Kgs	10Kgs	25Kgs
Wind surface	0,11SQM			0,18SQM
Frequency range	87,5 ÷108 MHz			
Input impedance	50Ohm			
VSWR	≤1,4:1			
Internal parts	Silver-plated brass and PTFE			
External parts	Aluminium	Hot Galvanized steel	Aluminium	Hot galvanized steel
Mounting	From 60 to 120mm diam.			
Dimension	60x1400x850			100x1340x910

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FM DIPOLE ANTENNAS
FM ACCESSORIES

N°BAYES	dB GAIN	POWER GAIN	ANTENNA APERTURE (MT)	WEIGHT (Kg)			WIND LOAD (v=150m/h)		
				PLS1	DIP11	DIP15	PLS1	DIP11	DIP15
1	2	1.58	1.4	4	7	16	10	18	25
2	5	3.16	4.1	8	14	32	20	36	50
4	8	6.3	9.5	16	28	64	40	72	100
6	9.8	9.5	14.9	24	42	96	60	108	150
8	11	12.6	20.3	32	56	128	80	144	200

CODE	MODEL	DESCRIPTION
0000170003	PLS1	Aluminium Dipole, 600W N Connector
upon request	PLS16	Aluminium Dipole, 1500W 7/16 Connector
0000170013	DIP11/N	Galvanized steel dipole, 600W N connector
0000170014	DIP11/16	Galvanized steel dipole 1.5Kw 7/16 connector
0000170015	DIP11/F	Galvanized steel dipole, 1,5 kW 7/8 flange
0000170011	DIP15/F	Galvanized steel dipole, 5kW 7/8 flange
0000170597	DIP13/N	Aluminuim dipole, 500W de mountable N connector
0000170596	DIP13/H/N	Aluminuim dipole, 800W, de mountable N connector
0000170484	DIP13/16	Aluminium dipole, 1500W de mountable 7/16 connector

PANEL DIPOLES
FM ACCESSORIES

APL1

APL5

These advanced and hot galvanized steel panel antennas are successfully used in high power antenna system arrays. The standard application of the panel antenna is to be mounted on one side of the transmitting tower for radiating systems with directional coverage. Whenever a circular pattern on a large area should be achieved, four antennas can be mounted in correspondence of the four sides of the transmitting tower. An accurate testing processed is carried out at factory on each antenna to control the compliance to all the stated figures.

SPECIFICATIONS	APL1	APL5
RF Input Power	600-1500W	200-5000W
Input Connector	N-7/16-7/8	7/16-7/8
Polarization	Veritcal or Horizontal	
Weight	23Kg	45Kg
Gain (Referred to half-wave Dipole)	6dB	7,5dB
H Plane-V Plane	130°-73° (78°-160°)	57°-73°
Max Wind Velocity	225Km/h	
Wind load (with speed at 150Km/h)	110Kgs	140Kgs
Wind surface	0,46 SQM	0,65 SQM
Frequency range	87,5÷108 MHz	
Input impedance	50Ohm	
VSWR	≤1.4:1	
Internal parts	Silver-plated brass and PTFE	
External parts	Hot galvanized steel	
Mounting	From 60 to 120mm diam.	
Dimension	2000x1280x850	

PANEL DIPOLES
FM ACCESSORIES

N° BAYES	dB GAIN		POWER GAIN		ANTENNA APERTURE (mt)		WEIGHT (kg)		WIND LOAD (v=150m/h)	
	APL1	APL5	APL1	APL5	APL1	APL5	APL1	APL5	APL1	APL5
1	6	7,5	4	5,6	2	2,5	27	45	110	140
2	9	10,5	8	11,2	4,7	5,2	54	90	220	280
4	12	13,5	16	22,4	10,1	10,6	108	180	440	560
6	13,8	15,3	24	33,6	15,5	16	162	270	660	840
8	15,1	16,5	32	44,8	20,9	21,4	216	360	880	1120

CODE	MODEL	DESCRIPTION
0000170439	APL1/16	Dipole panel galvanized steel ,7/16 Connector
0000170440	APL1/F	Dipole panel galvanized steel 7/8 flange
0000170441	APL1/N	Dipole panel galvanized steel N connector
0000170012	APL5/16	Double dipole panel galvanized steel, 2kW 7/16 connector
0000170404	APL5/F	Double dipole panel galvanized steel, 5kW 7/8 Flange

CIRCULARLY POLARIZED DIPOLES
FM ACCESSORIES

These antennas have been designed to obtain circularly polarized radiant patterns, for low and medium output power FM radio transmitters. For easy and low cost transportation, the PLC4 models are disassembled and packed. The PLC5 model is factory tuned onto any channels within 87.5-108 MHz according to the customer's requests. Standard PLC4 are realized in stainless. Due to their higher dimensions and to reduce excessive weight of antenna system, PLC4-H (high power antennas) are realized in aluminuim covered by a special paint treatment, for heavy duty service and long term duration.

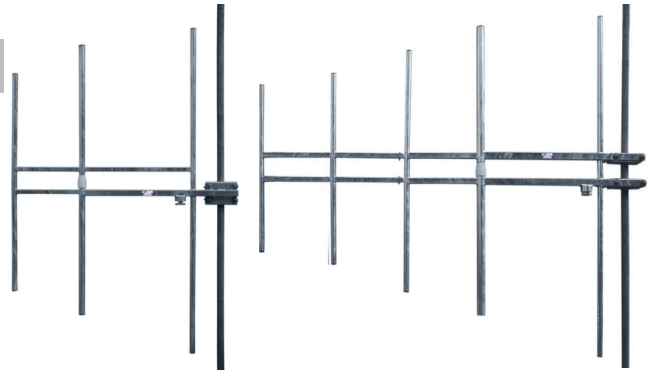
SPECIFICATIONS	PLC4	PLC 4H	PLC 4R	PLC 5
RF Input Power	600-1500-3000W	5000W	600-1500-3000W	500W
Input Connector	N-7/16-7/8	7/8	N-7/16-7/8	N
Polarization	Circular			
Weight	12Kg	14Kg		4Kg
Gain (Referred to half-wave Dipole)	-1,5dB		0dB	-1,5dB
H Plane-V Plane	Onmidirectional		Directional	270°-330°
Max Wind Velocity	150Km/h			
Wind load (with speed at 150Km/h)	45Kgs	80Kgs	75Kgs	25Kgs
Wind surface	0,1SQM	0,16SQM	0,15SQM	0,09SQM
Frequency range	87,5 ÷108 MHz			
Input impedance	50Ohm			
VSWR	≤1,4:1			
Internal parts	Silver-plated brass and PTFE	Aluminium treatment	Silver-plated brass and PTFE	
External parts	Stainless steel	Alodyne	Stainless steel	
Mounting	From 60 to 120mm diam.			
Dimension	1240x1520x1150			580x850x350

CIRCULARLY POLARIZED DIPOLES
FM ACCESSORIES

CODE	MODEL	DESCRIPTION
0000170044	PLC4/N	Double-crossed dipole Stainless steel ,800W N Connector
0000170043	PLC4/16	Double-crossed dipole Stainless steel ,2KW 7/16 Connector
0000170436	PLC4/F	Double-crossed dipole Stainless steel ,3KW 7/8 Flange
0000170448	PLC4/H/F	Double-crossed dipole Aluminium ,5KW 7/8 Flange
0000170467	PLC5/N	Tuned dipole narrow band stainless steel, 600W N Connector
0000170489	RPLC4	Reflector for double-cross dipole model PLC4
0000170490	RPLC4/H	Reflector for double-cross dipole model PLC4/H

OMNIDIRECTIONAL ANTENNAS
FM ACCESSORIES

ADR3



ADR5

These wideband directional antennas are available in two versions with 3 or 5 elements. They are made of hot galvanized steel and are especially designed for medium and high output power transmitters. The robust design of these antennas make them suitable for any climate conditions and lifetime duration, high quality and selected materials have been used in any details: all insulator are made of PTFE and screw are stainless steel. The metallic parts are electrically grounded. The ADR3 model is also available for 140-174 MHz band and 174-215 Mhz, these aerials can be disassembled in two parts, thus allowing lower freighting costs.

SPECIFICATIONS	ADR3	ADR5	LOG5	LOG8
RF Input Power	800-2Kw-3Kw	800-2Kw-4Kw	500W	2Kw
Input Connector	N-7/16-7/8		N	7/16
Polarization	Vertical		H/V	
Weight	10Kg	17Kg	4,5Kg	15,5Kg
Gain (Referred to half-wave Dipole)	5dB	6,5dB	6dB	7,9dB
H Plane-V Plane	Onmidirectional		Directional	270°-330°
Max Wind Velocity	200Km/h			
Wind load (with speed at 150Km/h)	21,5Kgs	32Kgs		
Wind surface	0,19 SQM	0,30SQM		
Frequency range	87,5 ÷108 MHz			
Input impedance	50Ohm			
VSWR	≤1,4:1			
Internal parts	Silver-plated brass and PTFE			
External parts	Hot galvanized steel			
Mounting	From 60 to 120mm diam.			
Dimension	1250x1800x70	1850x1800x70		

OMNIDIRECTIONAL ANTENNAS
FM ACCESSORIES

CODE	MODEL	DESCRIPTION
0000170001	ADR3/N	Double-crossed dipole Stainless steel ,800W N Connector
0000170002	ADR3/16	Double-crossed dipole Stainless steel ,2KW 7/16 Connector
0000170400	ADR3/F	Double-crossed dipole Stainless steel ,3KW 7/8 Flange
0000170385	ADR5/N	Double-crossed dipole Aluminium ,5KW 7/8 Flange
0000170401	ADR5/16	Tuned dipole narrow band stainless steel, 600W N Connector
0000170402	ADR5/F	Reflector for double-cross dipole model PLC4
upon request	LOG5	Reflector for double-cross dipole model PLC4/H
upon request	LOG8	FM Log Periodic 8-Elements Aluminium 500W Demontable 7/16

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